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R. H. STINCHFIELD, *Editor*

Editorial Office: 1155 16th Street, N. W., Washington 6, D. C.

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When the sap begins to run

Better Crops with PLANT FOOD

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Remembering . . . .

Outmoded Bygones

Jeff McDermid

I HAVE reached a stage of life where "remembering out loud" exposes me to instant placement among the patriarchs and the elders. We of the generation that was young in the days I shall dwell upon must be cautious about displaying old notions with youngish neckties or giving advice on youth's duties while quoting ancient incidents.

This danger is relatively more acute than it was in bygone days of parental admonition. The experiences then drawn upon by our astute advisers were not greatly removed from those common to the era in which we sprouted our wings for flight. That is, the change from the candle to the lamp or from the oxcart to the buggy was not so revolutionary as the transformation through which our own generation has since emerged to exert its directing influence.

Yet as I scan the scroll of time that has really shifted so imperceptibly, I regret that some of the youngsters of today cannot return even in some dream or vision to partake of the thrills we had over things that have passed away —outmoded and obsolete, discarded and almost forgotten. Sometimes they attempt it in the "gay nineties" movies and light operas, and we sometimes see a flickering return of women's fashion foibles to grace the modern moment—always barring the ironclad corset and the bustle at the stern.

The trouble about all this is that, when I begin to air my memories in public, my terminal facilities run out. The same old thing happens when I start yapping about the good old times before a select group of kids. So in order to relieve myself of a load of accumulated nostalgia, I shall use this medium for a surplus diversion program at your expense. Readers who are under thirty have now had fair warning and may retire at this point to study the latest report of the Atomic Energy Commission.

I SHOULD like to take incidents of the streets and of the town where I was fetched up by hand. If you can remember any of the moldiest of these recollections of mine it means that we both belong to the cult of the oldsters, and can look backward, we trust, without reproach or without regret.

Of these shadowy filaments, my friends, are fashioned these vanished things which we have seen and heard, and often loved; and which, methinks, our land shall see no more.

Across the village street at a board sidewalk's edge at Uncle Goodrich's corner stood an iron pole surmounted by a gas burner caged within a thick glass frame. Each evening in winter when outdoor play had ceased, the kids used to watch for the lamplighter. He was an old man who carried a wick lighter on a short pole, with a wrench attached. I can see him yet fumbling with his gadget and reaching up to turn on the gas and ignite it. To us who burned kerosene lamps this blue glare of the street light seemed a modern marvel.

For many years on this same street the horses and rigs went bumping over a pavement made of wooden blocks set down edgewise. Timber was cheap in those days and few cared for smooth riding, being so close to the ups and downs of a pioneer terrain. When I was ten years old, the city fathers got a mandate from the citizens to improve the streets with crushed granite macadam. It was great sport to stand on the walks and watch the men shovel out the red gravel or lift the wagon beds to let it drop by gravity. Then the heavy rollers pulled by two span of horses or a steam traction engine crushed it flat. Next to the frequent house-moving jobs that passed our lot, this activity made us all want to be engineers. Many of us who later on couldn't pass our high school algebra dropped the ambitious notion.

The circus parade has been discussed so much that we'll pass it this time to mention an entertainment feature that gets somewhat less attention. In those days the local opr'y house billed several blackface minstrel troupes every year. Lew Dockstader never came our way. Beach & Bowers stick tightest in my memory. They always had a lively band and augmented their string fellows behind the music-makers with recruits from among the town kids. We burnt corked our faces and donned some loose fitting uniforms, which spoiled our fun a little because nobody ever recognized us at this hour of our triumph. We longed to be "end men" and be able to tell jokes so readily and sing jolly songs.

ANOTHER road classic of those innocent times was the "rube" show. I recall one they billed frequently as Uncle Josh Spruceby. In this case also there was a band, but the ensemble marching after it was a long line of actors and extras in overalls, boots, and straw hats. The main theme of the drama, of course, was the "villain who still pursued her." There was a mortgage and a snow scene, and a final thrill climax wherein the heroine in a coma was seized by Uncle Josh from where she lay prone on the slow-moving carriage that fed the buzzing log saw.

Inspired by these herculean histrionics, our town kids got chummy with the young son of the opr'y house manager. He fixed it so we could go up there Saturday afternoons when the house was empty of troupers and stage

our own amateur gymnastics and stunt acts. I spent most of these hours as the "audience" because the older boys did not want us infants to come back into the mysterious dressing rooms and wings. Not until I played a minor role in the high school class play did I get a chance to swagger behind the footlights, facing what seemed to me like a cavernous auditorium—actual seating capacity about 650.

One of my droopiest memories relates to a neighbor who went to the Chicago world's fair of 1893 and returned with a spidery, big-wheel bike; and I have a vague picture of him trundling along the sidewalk just a few years before our town went loony over "scorchers and crackerjacks" who were mounted on much the same general style of bicycle as we have today, but in dwindling numbers.

We had bicycle clubs and annual bike races. The clubs paraded down the street, as the constable had forbidden them to push folks off the rough brick walks, which were none too nice going anyhow. The riders were decked out in what they considered appropriate finery, the men in knickerbockers and floppy Alpine hats with feathers, and the girls in bloomers and tight waists, some with the balloon sleeves so fashionable then. We had a judging stand erected on the court-house square, and the wheelers glided by with heads erect and colors flying. Prizes were donated by enterprising merchants, and there was often a grand ball in the armory hall where winners were acclaimed. I suppose the only real replica of those outings on wheels is found across the ocean in Denmark or Holland. But our folks now scorn such muscular transportation.

I recall a county bike race we had that ended in the midtown section after running a course of six miles around the outskirts, involving a few stiff hills and rough terrain. In one of these races my cousin made entry and he rode in a weirdly tinted union suit baggy of knees, in lieu of athletic shorts. He was pretty fat and worked up a mighty lather, finally falling off in exhaustion just as he rounded the last turn at the corner saloon known as Mike's Place. Here they carried him in unconscious, which was the first time he had ever entered that place in such fashion, albeit he had made many a belated exit therefrom in a worse state.

THE races were usually won by a dapper blade who owned a tandem machine as well as a racer, and gave him his choice at the picnics, where fair companions brought the lunch boxes. He was later the first owner of a "horseless carriage" in our bailiwick, thereby enlarging his ego and his circle of female adorers. Alas, the poor lad was a casualty in the Spanish War, so his brief period of bliss seems justified.

Winter snows put an end to cycling, whereupon our best diversion was catching rides on farmers' bobsleds as they drove into town with cordwood

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Fig. 1. The eastern half of a field of tomatoes grown in 1947 by G. Romanko, Scarboro Junction. In 1946, this field was in cucumbers and cabbage. The above portion was manured and ploughed in the fall of 1946.

Fertilizing Tomatoes for Earliness and Quality

By C. E. Mighton[1] and J. H. Osborn[2]

Campbell Soup Company, New Toronto, Ontario

THE growing of processing tomatoes in Ontario is limited to those districts adjoining the southern boundaries of the Province where the climate is tempered by the Great Lakes. Even here, there are many years when a sizeable portion of the crop may be lost through early fall frost. In years when early frosts do not occur, the quality of late season deliveries is usually markedly lowered by the climatic conditions characteristic of the latter part of September and early October. Lower temperatures, together with decreased hours of sunshine, slow down the natural ripening processes and both colour and flavour suffer. In short, the processing tomato crop in Ontario is being grown on the northern boundary of the climatically suited territory. It is, therefore, perfectly obvious that we must do everything possible to encourage earlier production so that the bulk of the crop can be harvested by the 20th of September.

[1] Manager, Agricultural Department.
[2] Manager, Agricultural Research Department.

Logically enough, one is likely to think first of earlier varieties as one approach to this problem. Plant breeders, both in government and commercial employ, are devoting a great deal of time to this search. Another approach is to be sure the plants set in the field are well grown so they will get about the business of producing a crop with the minimum amount of delay. Of course, the physical condition of the soil, thoroughness of preparation, and subsequent cultivation can influence the rapidity of growth and development in the field. Figures 1 and 2 illustrate the effect land preparation can produce. While we recognize that all these factors command attention, it is not our purpose to consider them further in this discussion. We shall assume that they have been taken care of and that none of them is limiting in attaining our goal of early production.

Instead, we wish to consider here the remaining important factor over which we have control, which is the plant nutrient supply. Not only must there be sufficient plant food available to make sure that no delay is caused by lack of any one element, but also we should apply that food in such a manner that it will be used with the greatest efficiency. With this thought in mind, let us examine results that have been obtained from experimental records which indicate how much we have been able to accomplish along this line.

The generally low level of phosphorus in Ontario soils makes the phosphorus supply extremely important, particularly because of the prominent role this element plays in early root growth and development. In addition, the temperature of Ontario soils, during late May and early June, is not sufficiently high to bring about rapid release of phosphorus from the soil. The use of high-phosphorus-content transplanting solution has been most helpful in supplying the early demands of the tomato plant. But, phosphorus deficiency could be found in many of our fields, even where transplanting solution was used. Most of the fertilizers at present available do not have a sufficiently high phosphorus content to take care of the tomato crop requirements. As a result, it is becoming a common practice for growers to sup-

Fig. 2. The western half of the field shown in Figure 1. This portion was manured and ploughed in the spring of 1947. All other treatment was the same for both portions.

Fig. 3. Typical tomato plant where complete fertilizer was applied in bands at planting time. Photographed 3 weeks after planting.

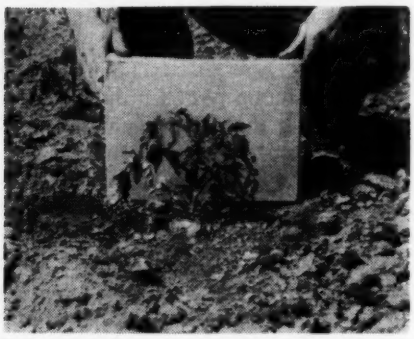

Fig. 4. Typical tomato plant where 1,000 lbs. superphosphate were applied under row and N and K sidedressed 2 weeks after planting. Photographed 3 weeks after planting.

plement their fertilizer applications with superphosphate under the row or, in some cases, to apply the total phosphorus requirement in the form of superphosphate placed under the row.

These practices have come about as the result of fertilizer recommendations based on soil tests and also from the supporting evidence we have gathered over a period of years from our own experimental plots. Representative results of these trials are presented in Table I. The trials chosen cover different soil types in three widely separated areas and in different years. As mentioned, the results are typical of practically all trials of this nature which we have conducted. In all cases, the trials were laid out on a randomized block plan with four being the minimum number of replications.

The 1947 tomato season was one of the poorest on record in Ontario. Heavy spring rains delayed planting until mid-June and the first frost occurred on September 26.

Figures 3 and 4 show the increased early growth resulting from placing phosphorus under the row. These pictures were taken on the Hagerman plot three weeks after setting.

TABLE I

Hagerman Plot—Prince Edward County—1939

Treatment	Total yield in tons/acre	% Yield by September 20
1,000 lbs.Superphosphate under row + 400 lbs. 10–0–25 as sidedressing.	21.8	90.0
Above materials mixed together and applied as complete fertilizer in bands at planting time.	15.0	67.0
No fertilizer.....	9.9	51.0
Silverthorn Plot—York County—1947		
1,000 lbs. 3–12–15 broadcast before planting and disked into soil.	5.4	52.0
Equivalent of above fertilizer with P_2O_5 under row, N and K_2O sidedressed.	9.4	42.0
No fertilizer.....	3.4	44.0
Beck Plot—Kent County—1948		
1,000 lbs. 3–12–15 broadcast before planting and disked into soil.	15.52	24.0
Equivalent of above fertilizer with P_2O_5 under row, N and K_2O sidedressed.	17.63	47.0
No fertilizer.....	12.43	28.0

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The "Put and Take" in Grassland Farming

By E. K. Walrath

Eastern States Farmers' Exchange, West Springfield, Massachusetts

COUNTY Agent Paul Browne, Hampden County, Massachusetts, learned from his roughage improvement demonstrations that in topdressing grass sods with 500 pounds of 10-10-10, more nitrogen and potash were taken to the barn in the hay than was applied in the fertilizer. The opportunities for increased yields from intensive fertilization cannot be offset by losses from soil depletion unless the increased amounts of plant nutrients taken to the barn and not used by the cows are so handled as to get back to the field.

Twelve dairymen cooperated with County Agent Browne in 1945, 1946, and 1947 in topdressing two acres each of well-manured hay and pasture sods with 900 pounds of 7-7-7 fertilizer. The 12 soils were representative of the dairy farm soils in the county. On 10 of these farms where records were secured, in 1945 and 1946 the first cutting of hay averaged 2.4 tons per acre compared with 1.5 tons for adjacent manured areas which were not topdressed with the 7-7-7. The rowen or second crops were grazed. The over-all average yield for three years from these two-acre tests was an extra ton of hay per acre from the commercial fertilizer used on manured land.

Three other cooperators topdressed their grass sods with 500 pounds of 10-10-10, and two of these men also made a double application to see what would happen. One field had a very productive soil that had been well manured or fertilized annually for many years. The second was an old timothy mowing that had been topdressed the previous year with manure and superphosphate. The third was an old, run-out hayfield that had been mowed once a year for the hay for a long time. This sod was largely of redtop, Kentucky bluegrass, and some weak timothy. Two cuttings were made on June 12 and August 23. The Fertilizer Service of the Eastern States Farmers' Exchange, West Springfield, Massachusetts, cooperated in the project by making chemical analyses of 36 hay samples for feed and fertilizer constituents.

What Did the 10-10-10 Do That Could Be Seen and Weighed?

The 500 pounds produced around a ton and a half of hay per acre. One

TABLE I—POUNDS OF HAY PER ACRE—TWO CUTTINGS

Soil Fertility Rating	Fertilized 500 Pounds 10–10–10	Unfertilized	Increase Pounds	Increase Per cent
Good	7,272	4,037	3,235	80
Fair	6,787	4,019	2,768	69
Poor	5,946	2,600	3,346	129

TABLE II—NITROGEN PERCENTAGE IN DRY MATTER OF GRASS HAY

Soil Fertility Rating	First Cutting—June 12		Second Cutting—August 23	
	500 pounds 10–10–10	Unfertilized	500 pounds 10–10–10	Unfertilized
Good	1.52	1.28	2.46	2.34
Fair	1.31	1.45	1.84	2.00
Poor	1.64	1.53	2.00	2.09

thousand pounds of 10-10-10 added another half ton, but the farmers considered the heavier growth that lodged unsatisfactory for hay but not so for pasture.

What the Chemists Found in the Grass

Nitrogen. The percentage of nitrogen in the dry matter in the first cutting was the highest on the poor soils. These grasses were less mature when cut on June 12 than the hay on the better soils. The order was reversed in the second cutting. These nitrogen data emphasize the need to consider the stage of maturity if high quality grass hay is to be harvested.

Phosphoric Acid. The grass hay grown on these three sandy loam soils had a desirable content of phosphoric acid, ranging from 0.52 per cent to 0.92 per cent P_2O_5. As with nitrogen, the unfertilized hay cut at the same time had the highest content. It was only on the best sod that the fertilization increased the phosphoric acid content of these grass hays.

Potash. The big surprise to Browne and these dairymen was the evidence of the high potash content of grass hay.

The results have these men thinking of the dollar and cents need to get more of the potash that the cows do not use back to the fields. This need was even more evident when it was learned from the yields and composition how much plant food the fertilized grass recovered from the applied fertilizer above that found in the unfertilized hay. These grass hays recovered from 59 to 120 per cent of the applied nitrogen, 26 to 50 per cent of the phosphoric acid, and 97 to 170 per cent of the potash put on these sods.

The high potash content of these grass hays fertilized with 500 pounds of 10-10-10 can well be shown in terms of complete fertilizer with 10 per cent nitrogen and the number of pounds of such a fertilizer that the hay from these fields took to the barn. This was equivalent in whole units of complete fertilizer to 1,220 pounds of 10-4-16 per acre for the best soil and 1,050

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TABLE III—POTASH PERCENTAGE IN DRY MATTER OF GRASS HAY

Soil Fertility Rating	First Cutting—June 12		Second Cutting—August 23	
	500 pounds 10–10–10	Unfertilized	500 pounds 10–10–10	Unfertilized
Good	2.56	2.93	3.88	3.03
Fair	1.69	1.49	1.86	1.26
Poor	2.17	1.67	2.40	1.27

Fig. 1. Empty houses stand in memory of a past type of farming. Share-croppers once occupied these buildings and produced cotton; now the families are gone and the land is utilized for hays and pasture. Some erosion can be seen as a result of clean-cultivated crops.

Wise Land Use Increases Farm Income in the South

By H. B. Vanderford

Agronomy Department, Mississippi State College, State College, Mississippi

MANY changes that have affected the economy and over-all conditions of the South have taken place during the past eight years. Among these, none is more significant than the change that has occurred in the field of Agriculture.

The once abundant supply of relatively cheap farm labor of the South has migrated to other fields of employment, and the farmers of many sections have changed their methods of farming. The pattern of land utilization observed in many sections now gives the farms a new look indicative of a more efficient type of farming. As a result, farmers are producing more cash crops than ever before on considerably less acreage, as well as producing a great quantity of forage crops and protecting the land from the ravages of soil erosion. All of these tend toward a higher level of farm efficiency and higher farm incomes.

TABLE I. CHANGES IN COTTON PRODUCTION IN MISSISSIPPI *

Item	1928–32	1935–39	1940–45
Acreage	4,018,000	2,901,000	2,847,000
Bales produced (500#)	1,559,000	1,830,000	1,684,000
Yields per acre (lbs. lint)	185	301	324

* Reports of B. A. E.

More Cotton on Less Acres

A good illustration of better land use and farm efficiency is observed in the changes that have occurred in the production of the No. 1 crop of the South, "King Cotton." Using Mississippi as a representative state of the cotton belt, the acreage planted to cotton has decreased consistently since 1933, but the volume of production has increased. The changes in cotton acreage, production, and yields per acre for Mississippi are given in Table I.

From the data presented in Table I, it should be noted that over 4,000,000 acres of cotton were planted during 1928-32 and 1,559,000 bales were produced. By 1945 the acreage had been reduced to 2,847,000 and 1,684,000 bales were produced, which means that the farmers of the State were producing more cotton on approximately 30 per cent less land. This is further emphasized by the yields per acre which increased from 185 pounds of lint in 1932 to 324 pounds in 1945.

The reduction in acres of cotton gave the farmers extra land for the production of other crops and at the same time the volume of cotton produced was also increased. This came about because the farmers kept the land best suited for cotton production in cotton and used more fertilizer and better varieties and cultural methods. The land that produced the low cotton yields has in most cases been utilized for the produc-

Fig. 2. One hundred bushels of corn per acre enables the farmer to produce his necessary corn on a few acres, thereby releasing land for production of hays and pastures. The efficient farmer plants his crops according to soil adaptations and then response to treatments is good.

Fig. 3. Some land that was once in cotton and corn is now utilized for pastures. The vigorous growth of this forage is indicative of the fertility that has been added to the soil.

tion of forage crops which have added considerably to the farm income in Mississippi.

Corn Production Is Following Same Trend

More efficient use of land is also seen in the present trends in corn production. Yields equivalent to those obtained in the corn belt are now being obtained on many acres in the South. Much has been learned in the last few years about producing high yields of corn on land low in natural fertility, and several articles have been written on the extension of the corn belt to the South. The acreage on which extremely high corn yields have been obtained is still small in Mississippi, and the State average has been increased very little, but the trend is upward. There were about 2,254,000 acres of corn planted in the State in 1947, and the average yield reported by the census was 16.5 bushels per acre. This is a slight increase over the average yield per acre during the last 10 years. The estimated average yield of the State for 1948 is more than 20 bushels per acre, which indicates that the number of acres producing near or 100 bushels of corn is still too small to greatly influence the average yield for 2,254,000 acres.

By producing a yield of 16.5 bushels per acre it would require approximately six acres of land to produce 100 bushels of corn. On most farms there is usually one acre that can be made to pro-

TABLE II. CORN PRODUCTION IN THE STATE OF MISSISSIPPI *

Item	1928–32	1936–45	1947
Acres harvested	2,177,000	2,824,000	2,254,000
Bushels produced	32,192,000	45,046,000	37,191,000
Yield per acre	14.7	16.0	16.5

* Reports of B. A. E.

duce approximately this amount of corn. By making proper application of research information, the farmer can produce his corn on one acre and release five acres for the production of other crops.

More than a million acres were removed from the cotton fields, and there is a possibility of another million being released from the corn patches. One doesn't generally think of increasing the volume of production of any crop by decreasing acreage, but that is the situation in the case of cotton and corn in the South. The acreage, production, and yields per acre of corn are shown in Table II.

The Pasture Situation

The reduction in acres planted to cotton and corn sets an excellent stage for the development of a program involving the production of forage and pasture crops. The significant changes in the land utilized for pasture that have taken place during the last few years in Mississippi are seen in the number of acres of improved pastures growing high quality feed. This increased acreage of improved pastures and feed crops is one reason why the South has been able to produce more livestock. Good pastures serve as one of the best kinds of livestock feed and at the same time furnish good protection for the land.

By fertilization and good management, many farmers have been producing profitable forage crops on some of the acres once in cotton or corn. The production of high quality forage crops which are utilized for the production of livestock and livestock products is now a general practice on many farms. To do this, the soils must contain sufficient minerals.

Some farmers have shifted completely from a row crop type of farming to a broadcast system. The mild climate which prevails generally over the South makes it possible for farmers to produce two crops per year on a part of the land without serious loss from accelerated soil erosion. This adds considerably to the over-all efficiency of the farm operation and expresses itself in the total farm income, as can be seen in the production data presented in Table III. The variation in prices makes it difficult to compare farm incomes for different periods, but the volume of production serves as a good basis.

More Fertilizer Needed

The only sad part of this important agricultural development is that adequate fertilizer supplies have not always been easy to obtain during the past few years. The more efficient methods naturally require the use of more fertilizers and minerals in the production of all important crops. The reduction in acreage of some of the major crops did not reduce the amount of commercial nutrients needed. Instead, in order to produce high yields, more fertilizer was and will be used on the land remaining in the major cash crop. Likewise, the production of nutritious forage and pasture crops, which are necessary for healthy livestock, is dependent upon an adequate supply of fertilizers and minerals. Most of the agricultural programs sponsored by the various agricultural agencies are framed around the use of more minerals and fertilizers on the farm land.

This all adds up to the fact that the farmers of the South will be needing larger quantities of commercial nutrients during the next few years and may not be able to get as much as they desire. Therefore, the fertilizers obtained should be used wisely on all farms. Soil-testing laboratories are in position to aid and assist farmers and operators in this important task.

Variations in the fertility levels of different fields should make it possible to vary the fertilizer applications so that more land can be treated. The fertility level of some fields as a result of previous treatments may be high enough to justify for a few years smaller applications of commercial fer-

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Maintaining the Productivity of Irrigated Lands

By C. A. Rechenthin

Soil Conservation Service, Fort Worth, Texas

MAINTAINING the productivity of the soil is perhaps the most important—certainly the most common—problem encountered by the irrigation farmer. Accumulation of harmful salts in the soil, rising water tables, and shortage of water supplies are other chief considerations in some areas, but loss of soil fertility has been a problem in all irrigated areas.

There is a large amount of information from experiment stations and field observations pertaining to methods of maintaining soil fertility. Some of the methods are well known; others are not generally understood. Many of the farmers who have started irrigation in the last few years have little or no knowledge of irrigation practices. It seems opportune at this time to present some of the available information, pointing out some of the things that can and should be done.

Declining soil fertility has been a problem quickly encountered in all irrigated areas. Decrease in soil fertility may be due to one or several reasons, some of which are:

1. Irrigation of soils unsuitable for irrigation.
2. Reduction of the organic matter in the soil.
3. Removal by crops of large amounts of plant nutrients which are not replaced in the soils.
4. Leaching of valuable plant foods from the soil by overirrigation.
5. Accumulation of harmful salts.
6. Rising water tables.

It is recognized that the selection of land suitable for irrigation is a primary requisite. Many factors influence the suitability, such as character of the soil, topography, and quality and quantity of water. To determine the suitability of an area requires exhaustive study and careful analysis of the conditions.

The accumulation of harmful salts and rising water tables are subjects on which much has been said and written. However, only the causes of reduced soil fertility dealing largely with cropping systems will be discussed at this time.

The great importance of organic matter in the soil is well known. It makes heavy soils lighter; light soils heavier. It promotes favorable chemical and biological activity. It is the natural source of nitrogen. It improves the soil-plant-water relationship. In short, it is an essential constituent of all normally productive soils.

The maintenance of soil organic matter is of major importance to the irrigation farmer. Many of the soils in irrigated areas have been formed under low rainfall and are naturally low in organic matter content. Under irrigation, moisture conditions are highly favorable for biological activity, and rapid breakdown of organic matter occurs. Severe crusting, or puddling, of irrigated soils is quite common in soils heavily cropped.

Studies at the Utah Agricultural Experiment Station show how rapid the breakdown of organic matter may be. They disclosed an average annual de-

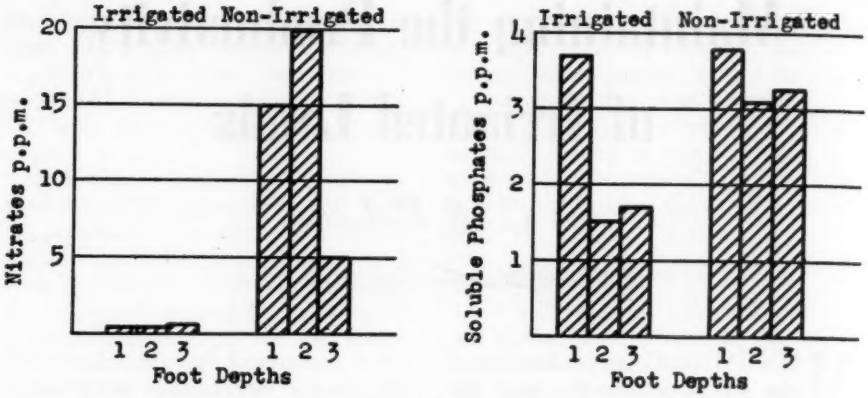

Fig. 1. Content of nitrates and soluble phosphates in irrigated and nonirrigated soils.

crease of 3,391 pounds of organic matter under continuous oats, but an average annual increase of 1,470 pounds under continuous alfalfa. (1)

The removal of large amounts of plant food in crop products without replacing them has been an important cause of reduced soil productivity. Many farmers in newly irrigated areas, such as the High Plains of Texas, have noticed a quick reduction in yields. In other parts of the State, lands have been abandoned after a period because of uneconomical returns.

Studies at the Panhandle, Oklahoma, Agricultural Experiment Station give some insight into why yields have declined so rapidly. Figure 1 shows the parts per million of nitrates and soluble phosphates in irrigated and nonirrigated soils after sudan grass was grown two years. (2)

The reduced yields on irrigated soils were believed due to overwatering, failure to rotate crops, and because the soil is somewhat shallow.

A very important cause of reduced yields that is generally not recognized by the farmer is overirrigation of lands. Overirrigation may result in waterlogging of the soils if heavy, or leaching from the soils large amounts of valuable plant nutrients if the soils are readily penetrated by water.

Studies conducted by the Texas State Board of Water Engineers and the U. S. Department of Agriculture in the lower Rio Grande Valley of Texas have

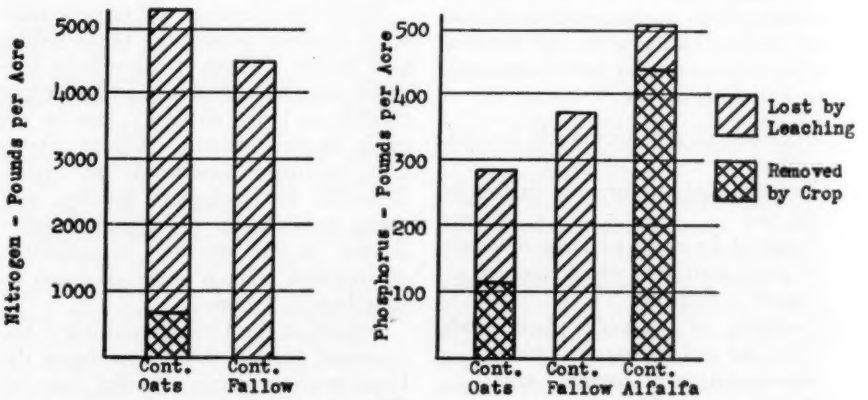

Fig. 2. Total loss per acre of nitrogen and phosphorus from soils under irrigation, 1916-34.

shown that under certain conditions a large amount of water may be lost through deep percolation. Of 6 inches of water added to a clay soil, about 2½ inches were lost by deep percolation and 3½ were used by the crop and lost by evaporation. On a sandy soil with 4 inches of water added, about 1½ inches were lost by deep percolation and 2½ by the crop and evaporation.

Studies at the Utah Agricultural Experiment Station give an indication of plant-food losses due partly or wholly to leaching. Figure 2 presents some of their data. (1)

For comparison, the soil under continuous alfalfa gained a total of 2,324 pounds of nitrogen per acre.

Figures 3 and 4 give some examples of reduced yields under irrigation at Huntley, Montana, and Scotts Bluff, Nebraska, Agricultural Experiment Stations.

The soil conservation districts in irrigated areas have recognized reduced soil fertility as a very important problem. With the assistance of the Soil Conservation Service and other agencies, they have developed a conservation plan for the districts that will maintain soil productivity as well as control erosion and conserve water supplies, and thereby provide for a permanent agriculture.

A conservation plan that will provide for a permanent agriculture includes the adapted practices applied to each acre according to its needs. No single practice will do this. The following practices need to be considered for developing a conservation plan for irrigated areas, with adaptations made to local conditions:

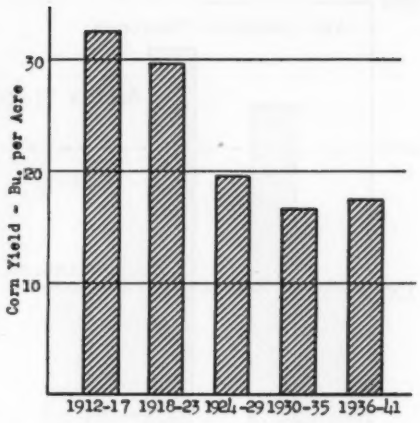

Fig. 3. Yields of corn grown continuously at Huntley, Montana. (4)

1. Addition of barnyard manures and organic residues.
2. Use of soil-improving crops such as green manures in rotation.
3. Application of commercial fertilizers.
4. Control of salt accumulations.
5. Application of the water according to the needs of the crops and soils.

Barnyard manure is a valuable source of plant food and organic matter. Its beneficial effect upon the soil in im-

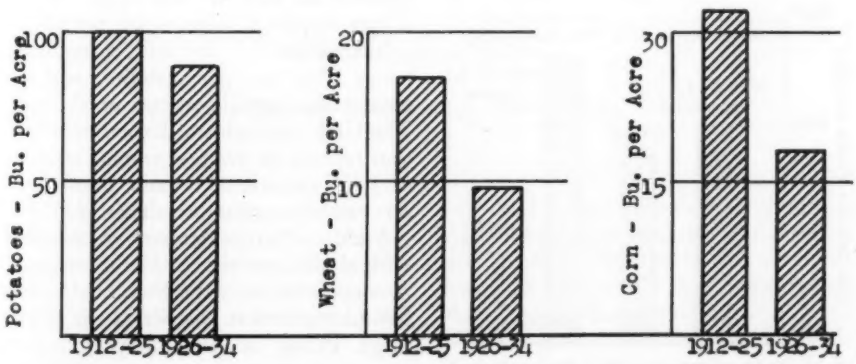

Fig. 4. Yields of various crops grown continuously at Scotts Bluff, Nebraska. (5)

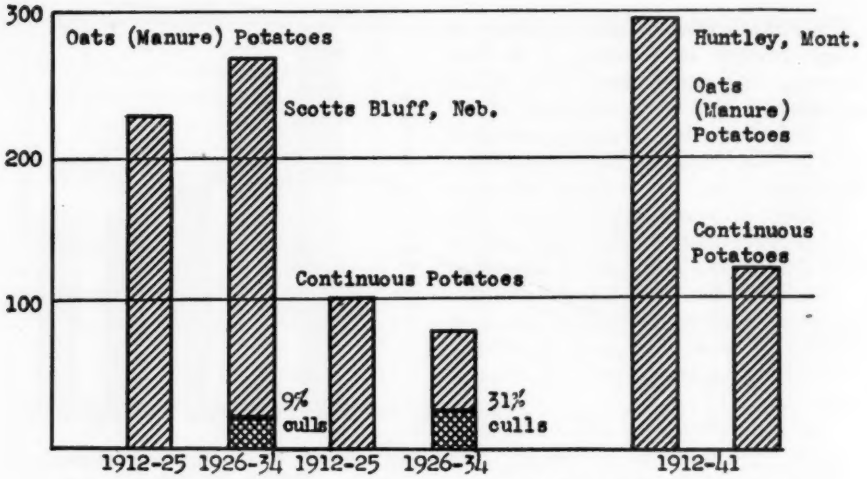

Fig. 5. Yields of potatoes at Scotts Bluff, Nebraska, and Huntley, Montana. (4 & 5)

proving aeration and biological activity, and in improving the tilth of the soil, exceeds its value for the plant foods it adds. Its value as a fertilizer is so well known that little needs to be said.

Figures 5, 6, and 7 show some results obtained from adding manure to the soil.

It is unfortunate that in most of our irrigated area little if any barnyard manure is available. An intensive type of agriculture as citrus orcharding, truck gardening, or cotton farming is practiced, and few livestock are found on the farms. The small amount of manure available from dairies or feed lots in nearby towns is far short of the amount needed. Farmers must, of necessity, resort to other means of improving and maintaining the soil productivity.

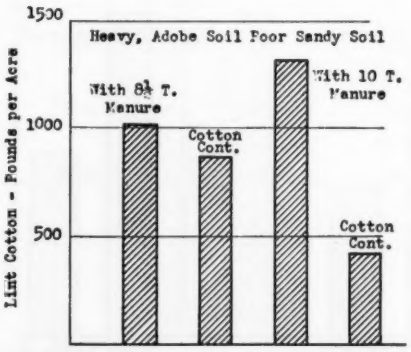

Fig. 6. Yield of cotton at New Mexico Agricultural Experiment Station, 1929-40. (6)

Green manure crops, and other soil-improving crops in rotation with soil-depleting crops, are often the most practical means of improving and maintaining soil fertility. There is a wide variety of crops that may be utilized as green manure and soil-improving crops in Texas. The principal ones are: alfalfa, biennial and annual sweetclovers, Ladino and white Dutch clovers, vetch, winter peas, crotalaria, sesbania, and improved pastures of mixtures of legumes and grasses.

Alfalfa is a crop that is widely used as a soil-improving crop, as well as to produce an excellent hay crop. It has a very beneficial effect upon the physical condition of the soil, promoting better tilth and permeability, and increases the organic matter of the soil. The Utah Agricultural Experiment Station reports an average annual increase of 1,470 pounds of organic matter per acre under continuous alfalfa. (1)

Yields of crops grown in rotation with alfalfa are increased in most cases. A cooperator with the Swisher County Soil Conservation District in the South High Plains of Texas reported that

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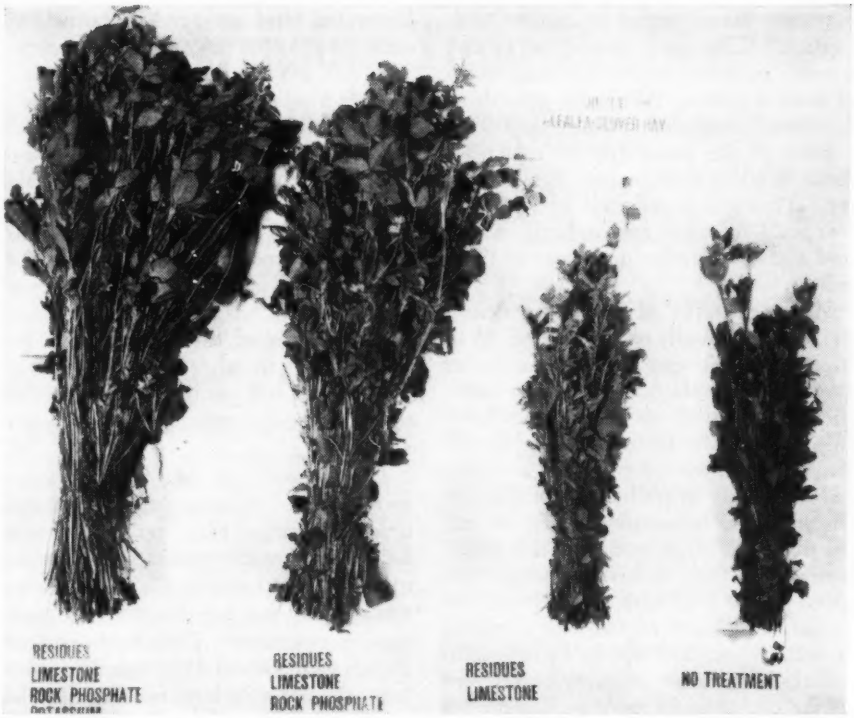

Fig. 1. Red clover-alfalfa from the Joliet experiment field. Each bundle represents the growth from a 4-sq.-ft. area. When fertilizer applications are adjusted to meet the need of the crop, there are satisfactory crop yields.

Lime Is Needed to Maintain Fertility

By H. J. Snider

Agronomy Department, University of Illinois, Urbana, Illinois

"THE relatively large quantity of calcium in the cation exchange complex is one of the controlling factors in soil fertility." This statement by Dr. H. P. Cooper is basically sound and applies especially to Illinois soils. Generally speaking, the most productive soils in Illinois are relatively high in available calcium and the less productive are relatively low in this element. Available calcium is that "calcium in the cation exchange complex."

Under field conditions in the Midwest, low calcium in unlimed soils is

generally accompanied by rather high acidity. This acid condition is frequently sufficient to prohibit the growth of most legumes. With the growth of legumes precluded, these soils are robbed of the possibility of replenishment of active nitrogenous organic matter. This loss is reflected by relatively low total nitrogen and organic matter and also low producing power of these soils.

A large supply of available calcium in soils is usually accompanied by a higher total nitrogen and organic matter content. An abundance of the latter means good tilth and high water-holding capacity in addition to other advantages. Improved tilth and moisture aid materially in pulling crops through the short drouth periods which are frequent in the Midwest and which create havoc with the yields of forage and grain crops. Moisture and tilth aid also in the availability of nutritive elements in the soil and their uptake by the plant.

Relatively large amounts of calcium in the cation exchange complex do not necessarily mean that the production of crops may not be benefited by additions of finely ground limestone. Soils of a high productive level, untreated, were found to contain an average of 7,700 pounds available calcium in the topsoil and had a reaction of pH 5.5 (Table 1). Untreated land averaged 51 bushels of corn and 3,000 pounds hay an acre. This soil, after liming, contained 10,000 pounds available calcium and had a reaction of pH 6.4. With lime and higher pH, the legume growth conditions were improved; consequently, the corn yield rose to 73 bushels and the hay yield rose to 5,200 pounds an acre. This was a 43% increase in corn yield and 73% increase in hay yield. These crop yields are not maximum for this land because many of these limed soils are yet deficient in other elements, mainly phosphorus and potassium, deficiencies that are usually sufficient to limit crop yields.

Hay grown on highly productive soils varies in its makeup on limed and unlimed land. Hay on experiment fields was usually seeded as a mixture of timothy-red clover-alfalfa. In some recent tests the hay from limed plots was approximately 75% legumes (red clover-alfalfa) and 25% timothy. Hay from the unlimed land was found to be made up of approximately 85% timothy and 15% red clover on the dry-weight basis. Hay from untreated, low productive soils was made up largely of wild grass and weeds, with a very small amount of timothy.

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TABLE I—COMPARISON OF SOILS OF HIGH AND LOW PRODUCTIVE LEVELS. REACTION, REPLACEABLE CALCIUM, TOTAL ORGANIC MATTER IN THE SOIL ALONG WITH CORN AND HAY YIELDS

Soil Productive Level	pH	Pounds an Acre		Corn bu/A	Hay lbs/A
		Replaceable Ca	Organic Matter		
		Untreated Soil			
High	5.5	7,700	96,000	51	3,000
Low	4.7	730	31,000	11	500
		Limed Soil			
High	6.4	10,000	106,000	73	5,200
Low	6.5	3,000	33,000	30	3,200

Each value an average of five experiment fields. Corn and hay yields represent the rotation average (1944-47) from the various fields.

Increasing Tung Profits with Potassium

By Benjamin G. Sitton, John H. Painter, Ralph T. Brown, Seymour G. Gilbert, and Matthew Drosdoff[1]

U. S. Department of Agriculture

PREVIOUS reports of experiments of the U. S. Department of Agriculture have shown that yields of tung oil are greatly increased by the application of nitrogenous fertilizers. The practice of applying liberal amounts of a nitrogen fertilizer, such as ammonium nitrate, has been very generally adopted in the tung industry, at least to the extent of its availability. Wherever used in conjunction with a reasonable application of phosphorus to the cover crop, it has proved very profitable to the growers. Further progress of our experiments, however, indicates that phosphorus on the cover crop and a heavy application of the nitrogen directly to the trees are not enough. In the long run, in order to maintain health of the trees and high oil content of the fruit, one also must apply potassium.

In an experiment at Bush, Louisiana, trees in plots to which no fertilizer is applied excepting phosphorus at the rate of 40 pounds of P_2O_5 and potassium at the rate of 20 pounds of K_2O per acre annually, on the cover crop at seeding time, have produced about 1 ton per acre per year for the period 1943-1947 inclusive (Table I). The fruits contain approximately 1.5 per cent of potassium or 30 pounds K_2O per ton of fruit, which means that nearly as much K_2O was removed by the crop from these plots as that applied to the cover crop. Analyses of the leaves show that with production at 1 ton per acre the potassium is rapidly being depleted; probably on that account the percentage oil content of the fruit has declined steadily from 19.9 to 17.8 in the period 1943 to 1946.

Trees in plots that have received nitrogen at the rate of 0.16 pound N per tree per year of attained age, supplementary to the cover-crop fertilizers, have produced very heavily, the yields increasing steadily from about 0.8 ton per acre in 1943 to approximately 2.0 tons per acre in 1946. However, leaf analyses indicate that potassium has been depleted even more rapidly than where no supplementary nitrogen was used; and although the nitrogen at first increased the percentage of oil in the whole fruit to 21.0 per cent, it declined

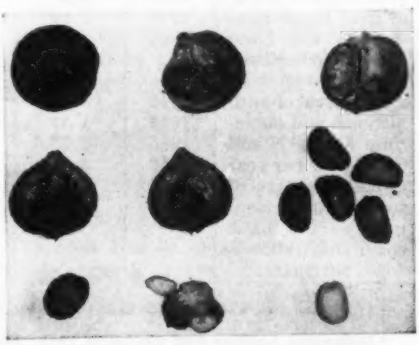

Fig. 1. Parts of the tung fruit.

[1] Horticulturist, pomologist, assistant horticulturist, plant physiologist, and soil technologist, respectively, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Department of Agriculture, Bogalusa, La., Cairo, Ga., Spring Hill, Ala. and Gainesville, Fla., respectively.

steadily to 20.3 per cent in 1944, 18.9 in 1945, and 18.4 in 1946 (Table I).

Certain other plots have received not only the supplementary nitrogen but also potassium at the rate of ¾ pound of K_2O applied directly to the trees, for every pound of supplementary nitrogen. This is roughly a ratio of 1 pound of 50% muriate of potash to 2 pounds of ammonium nitrate. Here the yields have been only slightly greater than where the supplementary nitrogen was used; but the potassium content of the leaves has declined only slightly and the oil content of the fruit has been maintained at nearly the original rather high level of approximately 21.0 per cent on the basis of 15.0 per cent moisture in the whole fruit.

By using the 1947 scale of $72 per ton for fruit having 20 per cent of oil, with increases of $4.50 per ton for each percentage unit of oil above 20 per cent and decreases of $3.60 for each percentage unit of oil below 20 per cent, it is found that a ton of fruit from trees receiving the supplemental nitrogen and potassium fertilizer was worth $0.90, $3.15, $5.31, and $8.91 more per ton in 1943, 1944, 1945, and 1946, repectively, than the fruit from trees receiving only supplemental nitrogen. The cost of harvesting and delivering to the mill a ton of fruit of the higher oil content is the same as for a ton of fruit of the lower oil content. Therefore the increase in value of fruit was obtained for the cost of the muriate of potash and the labor for applying it to the trees. The value of the fruit produced per acre, obtained from the product of the yield and the value per

TABLE I.—EFFECT OF NITROGEN AND POTASSIUM ON YIELD, OIL CONTENT, AND VALUE OF THE CROP OF TUNG TREES IN AN ORCHARD NEAR BUSH, LOUISIANA, PLANTED IN 1938.

Treatment	Year	Yield air-dry fruit per acre	Potassium in leaves dry basis	Oil content whole fruit 15 per cent moisture	Value per ton of fruit 1947 scale[1]	Value per ton acre 1947 scale
		Tons	*Per cent*	*Per cent*		
No fertilizer other than 500# basic slag and 40# muriate of potash applied to the cover crop at seeding	1943[2]	1.17	.86	19.9	$71.64	$83.82
	1944	0.83	.82	18.9	68.04	56.47
	1945	1.36	.78	18.4	66.24	90.09
	1946	1.19	.58	17.8	64.08	76.26
	1947	1.16				
A high level of nitrogen (0.16# per year of attained age of tree) supplementary to the basic cover-crop fertilizers	1943	0.76	.85	21.0	76.50	58.14
	1944	1.19	.70	20.3	73.35	87.29
	1945	1.36	.62	18.9	68.04	92.53
	1946	1.97	.56	18.4	66.24	130.49
	1947	1.67				
A high level of both nitrogen and potassium (0.16# N and 0.12# K_2O per year of attained age of tree) supplementary to the basic cover-crop fertilizers	1943	0.80	.96	21.2	77.40	61.92
	1944	1.19	.95	21.0	76.50	91.04
	1945	1.38	.89	20.3	73.35	101.22
	1946	2.23	.76	20.7	75.15	167.58
	1947	1.62				

[1] $72.00 per ton, less $3.60 for each percentage unit of oil under 20.0, or plus $4.50 for each percentage unit of oil above 20.0.

[2] Differential fertilizer first applied in 1943. Composition of the fruit was affected that season but not yields, which were determined by buds set in 1942.

ton of fruit, was $30.82, $2.44, and $54.23 greater in 1944, 1945, and 1946, respectively, from trees receiving the supplemental nitrogen than from trees receiving only the basic cover-crop fertilizers. The per-acre value of the crop from trees receiving both supplemental nitrogen and potassium was $3.75, $8.69, and $37.09 more in the same respective years than the crop from trees receiving only the supplemental nitrogen. At $63.00 per ton the ammonium nitrate used for the four years, 1943 to 1946 inclusive, cost $28.67 per acre and resulted in $87.49 increased value of the 1944-1946 crops at 1947 prices. At $53.30 per ton, muriate of potash for the same four years cost $11.65 per acre and resulted in $49.53 increased value of the crops.

The results described above were obtained in an orchard on a soil that analyzes 0.55 per cent available (exchangeable) potassium in the top 6 inches, which is about the maximum for soils on which tung is planted. Somewhat similar experiments have been conducted since 1945 in an orchard near Monticello, Florida, on soil that analyzes only 0.12 per cent available potassium in the surface 6 inches. There potassium has proved necessary, not only to improve oil content of the fruit, but also to obtain the maximum yield.

Plots that had 3 pounds of a 3-8-6 commercial fertilizer in 1945, 3 pounds of 6-8-9 in 1946, and 3 pounds of 6-8-12 in 1947 produced 1.13 tons of fruit in 1946 and 0.70 tons in 1947 (Table II). Analyses of the leaves show that the potassium content remained at a low level of approximately 0.60 per cent and the oil content of the fruit was 18.9 and 17.5, respectively, in 1945 and 1946.

Trees that were fertilized with 1 pound of N in addition to the basic rates of P_2O_5 and K_2O produced 1.50 and 0.93 tons of fruit in 1946 and 1947; and although the percentage of oil in the fruit was about the same as for fruit from trees on the low level of

Fig. 2. Potash-deficiency symptoms in tung leaves; interveinal necrosis above, and chlorosis below.

nitrogen, the percentage of potassium in the leaves decreased sharply to 0.46 and 0.47 per cent in 1945 and 1946 respectively.

Trees fertilized with 1 pound of N and 2 pounds of K_2O per tree in addition to the basic P_2O_5 application produced 1.84 and 1.34 tons per acre in 1946 and 1947, respectively, with an oil content of the whole fruit of 20.6 and 20.4 per cent for the two crops. The percentage of potassium in the leaves was increased from 0.60 in 1944 to 0.73 in 1945 and 0.91 in 1946. The increase in percentage of oil in the whole fruit resulted in an increased value per ton of fruit of $3.87 and $10.98 in 1945 and 1946 over that of fruit from trees not receiving the high level of potassium.

A serious depletion of potassium in the tung orchard causes the leaves to scorch and in extreme cases premature defoliation occurs. Foliage on the trees in the experiment at Monticello and in another experiment at Irvington, Ala-

TABLE II.—EFFECT OF NITROGEN AND POTASSIUM ON YIELD, OIL CONTENT, AND VALUE OF THE CROP OF TUNG TREES IN AN ORCHARD NEAR MONTICELLO, FLORIDA, PLANTED IN 1938.

Treatment	Year	Yield air-dry fruit per acre	Potassium in leaves dry basis	Oil content whole fruit 15 per cent moisture	Value per ton of fruit 1947 scale [1]
		Tons	*Per cent*	*Per cent*	
3 pounds 3–8–6	1945 [2]	.59	.56	18.9	$68.04
3 pounds 6–8–9	1946	1.13	.63	17.5	63.00
3 pounds 6–8–12	1947	.70			
A high level of nitrogen (1# N per tree) supplementary to basic rates for phosphorus and potassium	1945	.58	.46	19.0	68.40
	1946	1.50	.47	17.0	61.20
	1947	.93			
A high level of both nitrogen and potassium (1# N and 2# K_2O per tree) supplementary to basic rate of phosphorus	1945	.61	.73	20.6	72.27
	1946	1.84	.91	20.4	72.18
	1947	1.34			

[1] $72.00 per ton, less $3.60 for each percentage unit of oil under 20.0, or plus $4.50 for each percentage unit of oil above 20.0.

[2] Differential fertilizer first applied in 1945. Composition of the fruit was affected that season but not yields, which were determined by buds set in 1944.

bama, which received the low level of potassium fertilization, had a marginal scorch which was aggravated by applying only nitrogen. The high level of potassium nearly or completely corrected the marginal scorch in 1947. This same scorch has commenced to appear on some of the plots in the experiment at Bush, Louisiana, previously described, namely, some of those that receive a heavy application of nitrogen but no potassium other than the small amount applied to the cover crop.

From time to time it has been observed that the application of a high level of nitrogen tends to delay maturity of tung fruit. In the experiment at Irvington, Alabama, it was found that in addition such trees dropped their leaves earlier. On November 17, 1947, it was found that 17 per cent of the fruit and 49 per cent of the leaves were on the ground under trees that had received a high level of nitrogen without supplementary potassium. Trees that had received a high level of potassium with the high level of nitrogen had approximately 85 per cent of the fruit and 12 per cent of the leaves on the ground at that time. Every grower will appreciate the advantage in harvest operations if most of the fruit and few of the leaves are on the ground.

Summary

(1) On soils in the western part of the tung belt that are relatively rich in potassium, high yields have been attained by applying 0.16 pound of nitrogen per tree per year of attained age; but after 3 to 5 years, the oil content of the fruit has declined seriously.

(2) The application of potassium at the rate of 0.75 pound of K_2O for each pound of nitrogen used has maintained oil content at approximately 21.0 per cent in whole fruit having a 15 per cent moisture content. At the 1947 scale of prices such fruit is worth $8.91 per ton more than that from plots fertilized with nitrogen only.

(3) On soils in the eastern tung-growing areas, which are low in available potassium, the application of both potassium and nitrogen was necessary, not only to maintain oil content, but also to attain maximum yields.

Fig. 1. A comparison of size of the ears of corn on the plot grown by Albert Post. The pile on Post's right was taken from a section of the field that had an application of 600 lbs. fertilizer; the pile on his left had 1,200 lbs. There was a difference of 65 bushels in the yield by weight.

Four West Virginia Veterans Top 100-bushel Corn Yield

By L. Glenn Zinn

Instructor of Veterans in Agriculture, Grafton, West Virginia

IN a discussion on the use of fertilizer by the Veterans' On-the-Farm Training Class in Taylor County, West Virginia, the results of heavy applications of fertilizers used in other states in the effort to grow 100 bushels of corn per acre were cited as evidence that most farmers, especially those with limited amounts of tillable land, would be better off to plant less corn and use enough plant food to produce the maximum yield. Four of the group were persuaded to try an acre using a sufficient amount of commercial fertilizer to supply plant food above that which the soil might already contain so as to yield 100 bushels.

This is the story of their achievements. The decisions to make these trial tests were made too late to select the best soil, which these growers would have liked to do, and so they just planted part of the land that they were planning to plant in their regular rotation. The results in some cases would have been better if they had made a better selection, as the story will point out.

All four of the boys reached their

Fig. 2. Seven of the class coming in with the last load from the test plot on the farm of Bill Houghton (extreme left). Notice the size of the ears. From the 82 bushels of corn on this truck, there were only 6 baskets of short corn when it all was sorted.

goal of 100 bushels; in fact, all of them went over it. The yields ran 121, 115, 111, and 100.5 bushels. James Kerns had a yield of 121 bushels, the highest of the four, and he probably had the best land. He used an old sod that had not been plowed for several years, but it had been grazed. He put a heavy application of lime and 600 pounds of 4-12-8 fertilizer per acre on the sod, and turned this down just before planting time. Next he applied 200 pounds of 4-12-8 in the row at planting time and side-dressed with 200 pounds nitrate of soda at the last working.

They all used approved hybrid seed and aimed to plant to get a stand of about 14,000 stalks per acre, but none of them got over 11,000. That, according to all information we could get, was not enough stalks for the maximum yield, and was borne out by the large ears obtained in all the fields in several weight checks. On a dry basis the ears averaged 12 ounces.

Howard Kines, who made the second best yield, had what we thought the poorest land of the four. It was hilly land that had been badly worn in the past, but it had been idle for three years just growing weeds with nothing being taken off. It had been limed in the past but not recently. He applied about 700 pounds of 5-10-10 fertilizer with the corn drill as deep as it could be put down. He then drilled 100 pounds of nitrate along with the seed and used 200 pounds as a side-dressing. Putting this amount too close to the seed was a mistake as he did not get a good stand and had to replant. Replants usually do not make much corn, but we were surprised to find a good ear on each stalk and only a few days later than the other, but not as good as the first planting.

We had the wettest season on record in this section, and Howard's corn got very little cultivation. Part of it was never cultivated but had the weeds cut out by hand once. Yet there was very little difference in the yield—not enough to notice. There were just more weeds. None of the trial plots was cultivated as much as is the common practice, due to the wet season.

Why did this land, which a few years

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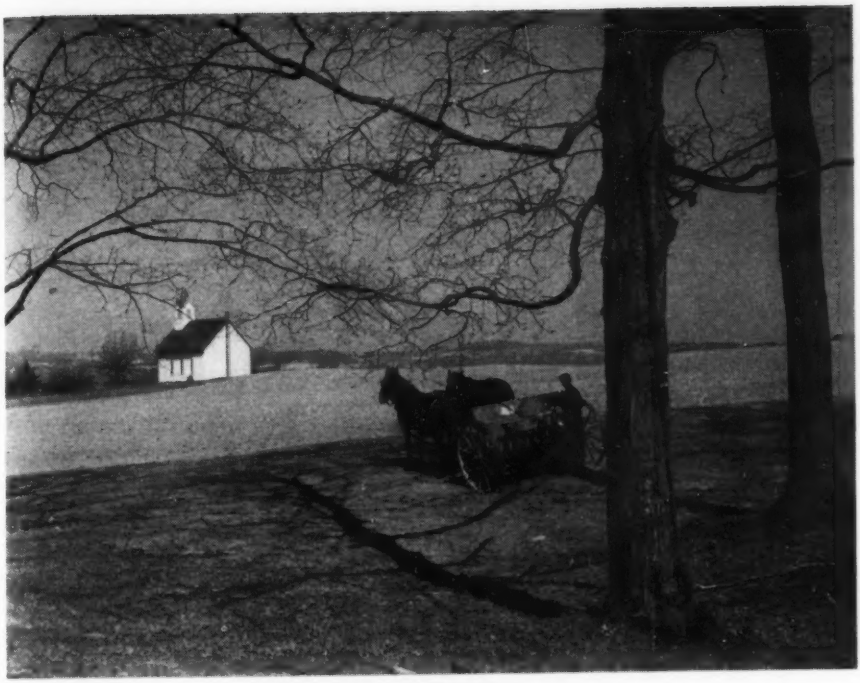
PICTORIAL

Not very inviting.

Above: **The last dig-out?**

Below: **Back on the land.**



Above: When shade is sparse.

Below: The time to prime.

Above: **A white macadam.**

Below: **Return to "bubbling."**

The Editors Talk

A National Land Policy

On December 9, 10, and 11, 1948, the Soil Conservation Society of America held its annual meeting in Cincinnati, Ohio. From this meeting came a statement, adopted by the Society and proposed as a "National Land Policy." We are indebted to T. S. Buie, President of the Society, for a copy of this statement and the suggestion that we give it the widest distribution possible. This we are glad to do on these pages, since nothing could be of more importance to the future of our American civilization than the wise use and care of our land.

"The conservation and wise utilization of natural resources are fundamental to the economic and social welfare of all people.

"Land, including soil, water, and the dependent living resources, (cultivated crops, forests, wildlife, range lands, etc.) is recognized as basic wealth and it must be treated in such a way that it will be made secure for permanent high productivity.

"It is essential, therefore, that a National Land Policy be developed and supported by the American people, and the Soil Conservation Society of America recommends that such a policy be declared as:

> ALL LAND SHOULD BE USED IN A MANNER WHICH WILL INSURE ITS CONTINUED AND PERMANENT MAXIMUM PRODUCTIVITY AND VALUES.

"To adopt and effect such a policy, the following requirements must be recognized nationally:

> The conservation of soil, water, and interdependent renewable resources involves scientific study and guidance, necessitating the bringing together as a single function many facets of a vast number of scientific fields; therefore, the science of soil and water conservation is intricate and complex.
>
> An inventory of all physical land resources and their condition is of primary importance to serve as the proper guide to the utilization and treatment of these resources.
>
> Specifically the widespread adoption of a sound land policy should comprehend the need for conservation, development, and utilization of land and water resources for: (1) sustained and improved agricultural production, (2) forest protection, re-growth, and sustained yield, (3) prevention of erosion and flood damages to safeguard land from overflow and siltation, (4) protection of community and industrial water supplies, (5) maintenance of underground water sources, (6) development and installation of irrigation and drainage as needed to extend appropriate land use and conservation, (7) protection and maintenance of fish and wildlife in accordance with proper land use, (8) development and utilization of areas most appropriately suited for needed recreational purposes, and (9) protection, and in certain cases, revegetation of areas suited to range utilization.

"The ultimate goal in land use is a complete soil and water conservation program on every farm, ranch, forest, and watershed throughout the country.

"To functionalize the above land policy and the specific principles involved, the Soil Conservation Society of America recognizes that:

> The conservation of soil and water by efforts of the individual landowners and operators is the most important contribution that can be made to the carrying out of this land policy. Locally and democratically organized groups of landowners and users are the best known vehicles for carrying out soil and water conservation programs designed to improve and perpetuate the productivity of our basic natural wealth—the land.
>
> Private ownership of land is, for the most part, the most suitable system under which a National Land Policy can be effective. It is recognized, however, that good management, public interest, and welfare necessitate public ownership and administration of certain land areas.
>
> The technical, educational, financial, and other services necessary to the adoption of a fully coordinated land use program should be thoroughly integrated and cooperatively performed, to carry out this land policy and all its principles.
>
> Private, corporate, and allied groups have a major responsibility in obtaining adoption of this land policy and in the conservation of soil and water.
>
> A workable method of carrying out coordinated programs of land use, soil and water conservation requires the joint and cooperative efforts of the federal, state, and local governments which are, or may become, engaged in these endeavors. It is also necessary that the administrative forces charged with such activities be given explicit responsibilities for contributions to such coordinated programs.

"In a great measure, our national economy, our democratic process, and our national security are dependent on the future conservation and use of our basic natural resources. These proposals, therefore, are made in the interest of the public health, safety, and general welfare of all the American people."

Southern Agriculture's Annual Meeting

Despite an unusual storm which covered many of the Southern States with ice and snow, more than 1,100 agriculturists convened in Baton Rouge, Louisiana, January 31–February 2 for the 46th annual meeting of the Association of Southern Agricultural Workers. Several large delegations, particularly from the Southwest, were turned back because of the storm, but the drop in anticipated registrations did not lessen intensity of interest in the general and sectional sessions in which the present status and future plans for all phases of the South's agriculture were projected.

The Association, largest of its kind in the United States, had picked as the theme for this meeting, "Progress in the South Through a Balanced Agricultural-Industrial Economy." Nineteen different sections scheduled their sessions throughout the three busy days so as to tie in with those of groups in the more closely related fields. Thus the whole had a broadening effect which is not always to be found in a convention of such proportions. There is stimulation in the recognition of the problems of others working for the same goal and this interchange of interest and realization of interdependence bespeak the popularity of this Association's conventions and the success for the continued advancement of Southern agriculture in line with constantly changing economic pressures.

Season Average Prices Received by Farmers for Specified Commodities *

Crop Year	Cotton Cents per lb.	Tobacco Cents per lb.	Potatoes Cents per bu.	Sweet Potatoes Cents per bu.	Corn Cents per bu.	Wheat Cents per bu.	Hay Dollars per ton	Cottonseed Dollars per ton	Truck Crops
	Aug.-July	.....	July-June	July-June	Oct.-Sept.	July-June	July-June	July-June	....
Av. Aug. 1909–July 1914....	12.4	10.0	69.7	87.6	64.2	88.4	11.87	22.55	....
1923.....	28.7	19.0	92.5	120.6	82.5	92.6	13.08	41.23	....
1924.....	22.9	19.0	68.6	149.6	106.3	124.7	12.66	33.25	....
1925.....	19.6	16.8	170.5	165.1	69.9	143.7	12.77	31.59	....
1926.....	12.5	17.9	131.4	117.4	74.5	121.7	13.24	22.04	....
1927.....	20.2	20.7	101.9	109.0	85.0	119.0	10.29	34.83	....
1928.....	18.0	20.0	53.2	118.0	84.0	99.8	11.22	34.17	....
1929.....	16.8	18.3	131.6	117.1	79.9	103.6	10.90	30.92	....
1930.....	9.5	12.8	91.2	108.1	59.8	67.1	11.06	22.04	....
1931.....	5.7	8.2	46.0	72.6	32.0	39.0	8.69	8.97	....
1932.....	6.5	10.5	38.0	54.2	31.9	38.2	6.20	10.33	....
1933.....	10.2	13.0	82.4	69.4	52.2	74.4	8.09	12.88	....
1934.....	12.4	21.3	44.6	79.8	81.5	84.8	13.20	33.00	....
1935.....	11.1	18.4	59.3	70.3	65.5	83.2	7.52	30.54	....
1936.....	12.4	23.6	114.2	92.9	104.4	102.5	11.20	33.36	....
1937.....	8.4	20.4	52.9	82.0	51.8	96.2	8.74	19.51	....
1938.....	8.6	19.6	55.7	73.0	48.6	56.2	6.78	21.79	....
1939.....	9.1	15.4	69.7	74.9	56.8	69.1	7.94	21.17	....
1940.....	9.9	16.0	54.1	85.5	61.8	68.2	7.58	21.73	....
1941.....	17.0	26.4	80.7	94.0	75.1	94.4	9.67	47.65	....
1942.....	19.0	36.9	117.0	119.0	91.7	110.0	10.80	45.61	....
1943.....	19.9	40.5	131.0	204.0	112.0	136.0	14.80	52.10	....
1944.....	20.7	42.0	149.0	192.0	109.0	141.0	16.40	52.70	....
1945.....	22.5	36.6	143.0	204.0	127.0	150.0	15.10	51.10	....
1946.....	32.6	38.2	122.0	218.0	156.0	191.0	16.70	71.90	....
1947.....	31.3	38.0	156.0	215.0	235.0	241.0	17.30	85.40	....
1948									
February.....	30.71	38.5	193.0	231.0	192.0	212.0	19.60	88.60	....
March.....	31.77	29.6	196.0	237.0	211.0	221.0	19.70	87.90	....
April.....	34.10	31.2	209.0	240.0	219.0	229.0	19.40	89.40	....
May.....	35.27	40.1	196.0	244.0	216.0	222.0	18.30	90.70	....
June.....	35.22	41.7	187.0	246.0	216.0	211.0	17.90	92.20	....
July.....	32.99	43.6	166.0	262.0	202.0	203.0	18.20	96.00	....
August.....	30.41	47.4	158.0	265.0	191.0	196.0	17.80	76.60	....
September...	30.94	46.7	153.0	232.0	178.0	197.0	18.00	68.10	....
October.....	31.07	50.6	142.0	207.0	138.0	198.0	18.40	63.70	....
November....	30.52	42.8	144.0	198.0	121.0	204.0	18.40	69.00	....
December....	29.63	45.7	154.0	219.0	123.0	205.0	19.10	68.80	....
1949									
January.....	29.27	42.9	166.0	236.0	125.0	202.0	19.80	65.70	....
Index Numbers (Aug. 1909—July 1914 = 100)									
1923.....	231	190	133	137	129	105	110	183	....
1924.....	185	190	98	170	166	141	107	147	143
1925.....	158	168	245	188	109	163	108	140	143
1926.....	101	179	189	134	116	138	112	98	139
1927.....	163	207	146	124	132	135	87	154	127
1928.....	145	200	76	134	131	113	95	152	154
1929.....	135	183	189	133	124	117	92	137	137
1930.....	77	128	131	123	93	76	93	98	129
1931.....	46	82	66	83	50	44	73	40	115
1932.....	52	105	55	62	50	43	52	46	102
1933.....	82	130	118	79	81	84	68	57	91
1934.....	100	213	64	91	127	96	111	146	95
1935.....	90	184	85	80	102	94	63	135	119
1936.....	100	236	164	106	163	116	94	148	104
1937.....	68	204	76	93	81	109	74	87	110
1938.....	69	196	80	83	76	64	57	97	88
1939.....	73	154	100	85	88	78	67	94	91
1940.....	80	160	78	97	96	77	64	96	111
1941.....	137	264	116	107	117	107	81	211	129
1942.....	153	369	168	136	143	124	91	202	163
1943.....	160	405	188	232	174	154	125	231	245
1944.....	167	420	214	219	170	160	138	234	212
1945.....	181	366	205	232	198	170	127	227	224
1946.....	263	382	175	249	212	209	141	319	204
1947.....	252	380	224	245	366	273	146	379	249
1948									
February.....	248	385	277	263	299	240	165	393	320
March.....	256	296	281	270	329	250	166	390	295
April.....	275	312	300	273	341	259	163	396	340
May.....	284	401	281	278	336	251	154	402	262
June.....	284	417	268	280	336	239	151	409	213
July.....	266	436	238	298	315	230	153	428	213
August.....	245	474	227	302	298	222	150	340	172
September...	250	467	220	264	277	223	152	302	150
October.....	251	506	204	236	215	224	155	282	176
November....	246	428	207	226	188	231	155	306	186
December....	239	457	220	250	192	232	161	305	209
1949									
January.....	236	429	238	269	195	229	169	291	282

Wholesale Prices of Ammoniates

	Nitrate of soda bulk per unit N	Sulphate of ammonia bulk per unit N	Cottonseed meal S. E. Mills per unit N	Fish scrap, dried 11–12% ammonia, 15% bone phosphate, f.o.b. factory, bulk per unit N	Tankage 11% ammonia, 15% bone phosphate, f.o.b. Chicago, bulk, per unit N	High grade ground blood, 16–17% ammonia, Chicago, bulk, per unit N
1910–14	$2.68	$2.85	$3.50	$3.53	$3.37	$3.52
1924	2.99	2.44	5.87	5.02	3.60	4.25
1925	3.11	2.47	5.41	5.34	3.97	4.75
1926	3.06	2.41	4.40	4.95	4.36	4.90
1927	3.01	2.26	5.07	5.87	4.32	5.70
1928	2.67	2.30	7.06	6.63	4.92	6.00
1929	2.57	2.04	5.64	5.00	4.61	5.72
1930	2.47	1.81	4.78	4.96	3.79	4.58
1931	2.34	1.46	3.10	3.95	2.41	2.46
1932	1.87	1.04	2.18	2.18	1.21	1.36
1933	1.52	1.12	2.95	2.86	2.06	2.46
1934	1.52	1.20	4.46	3.15	2.67	3.27
1935	1.47	1.15	4.59	3.10	3.06	3.65
1936	1.53	1.23	4.17	3.42	3.58	4.25
1937	1.63	1.32	4.91	4.66	4.04	4.80
1938	1.69	1.38	3.69	3.76	3.15	3.53
1939	1.69	1.35	4.02	4.41	3.87	3.90
1940	1.69	1.36	4.64	4.36	3.33	3.39
1941	1.69	1.41	5.50	5.32	3.76	4.43
1942	1.74	1.41	6.11	5.77	5.04	6.76
1943	1.75	1.42	6.30	5.77	4.86	6.62
1944	1.75	1.42	7.68	5.77	4.86	6.71
1945	1.75	1.42	7.81	5.77	4.86	6.71
1946	1.97	1.44	11.04	7.38	6.60	9.33
1947	2.50	1.60	12.72	10.66	12.63	10.46
1948						
February	2.78	1.90	15.03	12.15	12.75	12.60
March	2.78	1.90	13.68	12.06	12.75	9.47
April	2.78	1.90	13.87	11.71	12.75	8.35
May	2.78	1.90	13.77	9.54	12.75	7.89
June	2.78	1.90	14.69	9.11	8.23	8.24
July	2.78	2.07	14.56	9.22	8.80	8.73
August	2.91	2.10	10.91	9.76	8.92	8.98
September	3.00	2.20	10.70	9.87	9.18	9.03
October	3.00	2.20	9.31	9.98	9.41	9.48
November	3.00	2.20	11.00	10.31	10.44	10.68
December	3.00	2.20	11.52	11.65	11.39	11.46
1949						
January	3.15	2.23	10.29	8.68	11.53	11.53
Index Numbers (1910-14 = 100)						
1924	111	86	168	142	107	121
1925	115	87	155	151	117	135
1926	113	84	126	140	129	139
1927	112	79	145	166	128	162
1928	100	81	202	188	146	170
1929	96	72	161	142	137	162
1930	92	64	137	141	12	130
1931	88	51	89	112	63	70
1932	71	36	62	62	36	39
1933	59	39	84	81	97	71
1934	59	42	127	89	79	93
1935	57	40	131	88	91	104
1936	59	43	119	97	106	131
1937	61	46	140	132	120	122
1938	63	48	105	106	93	100
1939	63	47	115	125	115	111
1940	63	48	133	124	99	96
1941	63	49	157	151	112	126
1942	65	49	175	163	150	192
1943	65	50	180	163	144	189
1944	65	50	219	163	144	191
1945	65	50	223	163	144	191
1946	74	51	315	209	196	265
1947	93	56	363	302	374	297
1948						
February	104	67	429	344	378	358
March	104	67	391	342	378	269
April	104	67	396	332	378	237
May	104	67	393	270	378	224
June	104	67	420	258	244	234
July	104	73	416	261	261	248
August	109	74	312	276	265	255
September	112	77	306	280	272	257
October	112	77	266	283	279	269
November	112	77	314	292	310	303
December	112	77	329	330	338	326
1949						
January	118	78	294	246	342	328

Wholesale Prices of Phosphates and Potash * *

	Super-phosphate Balti-more, per unit	Florida land pebble 68% f.o.b. mines, bulk, per ton	Tennessee phosphate rock, 75% f.o.b. mines, bulk, per ton	Muriate of potash bulk, per unit, c.i.f. Atlantic and Gulf ports[1]	Sulphate of potash in bags, per unit, c.i.f. Atlantic and Gulf ports[1]	Sulphate of potash magnesia, per ton, c.i.f. Atlantic and Gulf ports[1]	Manure salts bulk, per unit, c.i.f. Atlantic and Gulf ports[1]
1910–14	$0.536	$3.61	$4.88	$0.714	$0.953	$24.18	$0.657
1924	.502	2.31	6.60	.582	.860	23.72	.472
1925	.600	2.44	6.16	.584	.860	23.72	.483
1926	.598	3.20	5.57	.596	.854	23.58	.537
1927	.525	3.09	5.50	.646	.924	25.55	.586
1928	.580	3.12	5.50	.669	.957	26.46	.607
1929	.609	3.18	5.50	.672	.962	26.59	.610
1930	.542	3.18	5.50	.681	.973	26.92	.618
1931	.485	3.18	5.50	.681	.973	26.92	.618
1932	.458	3.18	5.50	.681	.963	26.90	.618
1933	.434	3.11	5.50	.662	.864	25.10	.601
1934	.487	3.14	5.67	.486	.751	22.49	.483
1935	.492	3.30	5.69	.415	.684	21.44	.444
1936	.476	1.85	5.50	.464	.708	22.94	.505
1937	.510	1.85	5.50	.508	.757	24.70	.556
1938	.492	1.85	5.50	.523	.774	15.17	.572
1939	.478	1.90	5.50	.521	.751	24.52	.570
1940	.516	1.90	5.50	.517	.730	24.75	.573
1941	.547	1.94	5.64	.522	.780	25.55	.367 [1]
1942	.600	2.13	6.29	.522	.810	25.74	.205
1943	.631	2.00	5.93	.522	.786	25.35	.195
1944	.645	2.10	6.10	.522	.777	25.35	.195
1945	.650	2.20	6.23	.522	.777	25.35	.195
1946	.671	2.41	6.50	.508	.769	24.70	.190
1947	.746	3.05	6.60	.498	.706	18.93	.195
1948							
February	.760	3.42	6.60	.375	.669	14.50	.200
March	.760	3.42	6.60	.375	.669	14.50	.200
April	.760	4.11	6.60	.375	.669	14.50	.200
May	.760	4.61	6.60	.375	.669	14.50	.200
June	.760	4.61	6.60	.330	.634 [1]	12.76 [1]	.176
July	.770	4.61	6.60	.353	.676	13.63	.188
August	.770	4.61	6.60	.353	.678	13.63	.188
September	.770	4.61	6.60	.353	.678	13.63	.188
October	.763	4.61	6.60	.375	.720	14.50	.200
November	.770	4.61	6.60	.375	.720	14.50	.200
December	.770	4.61	6.60	.375	.720	14.50	.200
1949							
January	.770	4.61	6.60	.375	.720	14.50	.200
Index Numbers (1910-14 = 100)							
1924	94	64	135	82	90	98	72
1925	110	68	126	82	90	98	74
1926	112	88	114	83	90	98	82
1927	100	86	113	90	97	106	89
1928	108	86	113	94	100	109	92
1929	114	88	113	94	101	110	93
1930	101	88	113	95	102	111	94
1931	90	88	113	95	102	111	94
1932	85	88	113	95	101	111	94
1933	81	86	113	93	91	104	91
1934	91	87	110	68	79	93	74
1935	92	91	117	58	72	89	68
1936	89	51	113	65	74	95	77
1937	95	51	113	71	79	102	85
1938	92	51	113	73	81	104	87
1939	89	53	113	73	79	101	87
1940	96	53	113	72	77	102	87
1941	102	54	110	73	82	106	87
1942	112	59	129	73	85	106	84
1943	117	55	121	73	82	105	83
1944	120	58	125	73	82	105	83
1945	121	61	128	73	82	105	83
1946	125	67	133	71	81	102	82
1947	139	84	135	70	74	78	83
1948							
February	142	95	135	68	70	60	83
March	142	95	135	68	70	60	83
April	142	114	135	68	70	60	83
May	142	128	135	68	70	60	83
June	142	128	135	62	67	53	80
July	144	128	135	65	71	56	82
August	144	128	135	65	71	56	82
September	144	128	135	65	71	56	82
October	142	128	135	68	76	60	83
November	144	128	135	68	76	60	83
December	144	128	135	68	76	60	83
1949							
January	144	128	135	68	76	60	83

Combined Index Numbers of Prices of Fertilizer Materials, Farm Products and All Commodities

	Farm prices*	Prices paid by farmers for commodities bought*	Wholesale prices of all commodities†	Fertilizer material‡	Chemical ammoniates	Organic ammoniates	Superphosphate	Potash**
1924	143	152	143	103	97	125	94	79
1925	156	156	151	112	100	131	109	80
1926	146	155	146	119	94	135	112	86
1927	142	153	139	116	89	150	100	94
1928	151	155	141	121	87	177	108	97
1929	149	154	139	114	79	146	114	97
1930	128	146	126	105	72	131	101	99
1931	90	126	107	83	62	83	90	99
1932	68	108	95	71	46	48	85	99
1933	72	108	96	70	45	71	81	95
1934	90	122	109	72	47	90	91	72
1935	109	125	117	70	45	97	92	63
1936	114	124	118	73	47	107	89	69
1937	122	131	126	81	50	129	95	75
1938	97	123	115	78	52	101	92	77
1939	95	121	112	79	51	119	89	77
1940	100	122	115	80	52	114	96	77
1941	124	131	127	86	56	130	102	77
1942	159	152	144	93	57	161	112	77
1943	192	167	151	94	57	160	117	77
1944	195	176	152	96	57	174	120	76
1945	202	180	154	97	57	175	121	76
1946	233	202	177	107	62	240	125	75
1947	278	246	222	130	74	362	139	72
1948								
February	279	263	233	139	85	393	142	71
March	283	262	233	137	85	379	142	71
April	291	264	238	137	85	380	142	71
May	289	265	239	137	85	370	142	71
June	295	266	241	128	85	309	142	65
July	301	266	247	231	88	317	144	68
August	293	266	247	129	91	285	144	68
September	290	265	247	131	94	287	144	68
October	277	263	243	130	94	277	142	72
November	271	262	239	134	94	311	144	72
December	268	262	237	137	94	336	144	72
1949								
January	268	260	233	136	97	313	144	72

* U. S. D. A. figures. Beginning January 1946 farm prices and index numbers of specific farm products revised from a calendar year to a crop-year basis. Truck crops index adjusted to the 1924 level of the all-commodity index.

† Department of Labor index converted to 1910-14 base.

‡ The Index numbers of prices of fertilizer materials are based on original study made by the Department of Agricultural Economics and Farm Management, Cornell University, Ithaca, New York. These indexes are complete since 1897. The series was revised and reweighted as of March 1940 and November 1942.

[1] All potash salts now quoted F.O.B. mines only: manure salts since June 1941, other carriers since June 1947.

**** The weighted average of prices actually paid for potash is lower than the annual average because since 1926 over 90% of the potash used in agriculture has been contracted for during the discount period. Since 1937, the maximum discount has been 12%. Applied to muriate of potash, a price slightly above $.471 per unit K_2O thus more nearly approximates the annual average than do prices based on arithmetical averages of monthly quotations.**

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture, the State Experiment Stations, and Canada, relating to Fertilizers, Soils, Crops, and Economics. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

"Nutrient Interrelations in Lime-induced Chlorosis as Revealed by Seedling Tests and Field Experiments," Agr. Exp. Sta., Univ. of Ariz., Tucson, Ariz., Tech. Bul. 116, Nov. 1948, W. T. McGeorge.

"Guide for the Use of Borax on Common Crops," The Maritime Fertilizer Council, Moncton, N. B., Can., Issued Jan. 1949.

"Fertilizing Flue-cured Tobacco," Ga. Coastal Plain Exp. Sta., Tifton, Ga., Mimeo. Paper 16, Dec. 1942 (Rev. Dec. 1948).

"Fertilizers for Field Crops," Agr. Ext. Serv., Agr. Exp. Sta., Iowa State College, Ames, Iowa, Agron. 111, Dec. 1948.

"Inspection of Commercial Fertilizers and Agricultural Lime Products," Agr. Exp. Sta., Univ. of Mass., Amherst, Mass., Bul. 137, July 1948.

"Use of Commercial Plant Foods on Missouri Farms," Agr. Exp. Sta., Univ. of Mo., Columbia, Mo., Bul. 519, Oct. 1948, J. H. Longwell, A. W. Klemme, H. J. L'Hote, and J. R. Breuer.

"Phosphorus Needs of New Jersey Soils," Agr. Exp. Sta., Rutgers Univ., New Brunswick, N. J., Bul. 744, Oct. 1948, A. L. Prince and F. E. Bear.

"Fertilizer Recommendations for Oklahoma Crops," Agr. Exp. Sta., Okla. A & M College, Stillwater, Okla., Bul. B-326, Jan. 1949, H. J. Harper, H. F. Murphy, F. B. Cross, and H. B. Cordner.

"The Inspection of Commercial Fertilizers and Agricultural Lime Products for 1948," Related Services Div., Univ. of Vt., Burlington, Vt., Rpt. 10, Nov. 1948, L. S. Walker and E. F. Boyce.

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"Organic Matter—The Life of the Soil," Ont. Agr. College, Guelph, Ont., Can., Bul. 459, June 1948, G. N. Ruhnke.

"Soil Testing and Plant Growth," Agr. Ext. Serv., Miss. State College, State College, Miss., Leaflet 92, Oct. 1948, I. E. Miles.

"Soil Testing," Agr. Educ. Dept., Miss. State College, State College, Miss., Vet. Farm Training Publ. No. 6, Nov. 1948.

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"Let's Look at the Soil," Agr. Exp. Sta., Univ. of Mo., Columbia, Mo., Cir. 330, July 1948, M. F. Miller.

"Test Your Soil," Agr. Ext. Serv., Univ. of Mo., Columbia, Mo., Mo. 24E, Aug. 1948.

"Soil Fumigation for Nematode and Disease Control," Agr. Exp. Sta., Cornell Univ., Ithaca, N. Y., Sta. Bul. 850, Sept. 1948, A. G. Newhall and Bert Lear.

"Irrigation for Oklahoma," Agr. Exp. Sta., Okla. A & M College, Stillwater, Okla., Cir. C-131, Dec. 1948.

Crops

"Field Roots," Div. of Forage Plants, Field Husbandry and Animal Husbandry, Exp. Farms Serv., Ottawa, Can., Publ. 672, Farmers' Bul. 88, Oct. 1948 (Rev.), F. S. Nowosad, R. M. MacVicar, P. O. Ripley, and S. B. Williams.

"Better Pastures in Eastern Canada," Exp. Farms Serv., Dept. of Agr., Ottawa, Can., Publ. 809, Farmer's Bul. 150, Oct. 1948.

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"Effect of Time of Cutting Red Clover on Forage Yields, Seed Setting and Chemical Composition," Agr. Exp. Sta., Iowa State College, Ames, Iowa., Res. Bul. 357, June 1948, C. P. Wilsie and E. A. Hollowell.

"Point Your Farm to Balanced Production," Agr. Ext. Serv., Kansas State College, Manhatten, Kansas, Cir. 200, July 1948.

"White Clover for Mississippi Pastures," Agr. Ext. Serv., Miss. State College, State College, Miss., Ext. Agron. Folder No. 1, Sept. 1948, W. R. Thompson.

"Kentucky 31 Fescue for Mississippi in Mixture with White Clover," Agr. Ext. Serv., Miss. State College, State College, Miss., Ext. Agron. Folder No. 2, Sept. 1948, W. R. Thompson.

"Dallis Grass for Mississippi Pastures," Agr. Ext. Serv., Miss. State College, State College, Miss., Ext. Agron. Folder No. 3, Sept. 1948, W. R. Thompson.

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Wise Land Use Increases Farm Income

(*From page* 14)

tilizer than formerly used, without decreasing yields. This would make it possible to apply more nutrients to fields lower in fertility and would increase the over-all production on the farms with the minimum amount of fertilizers.

Efficient Land Use Increases Farm Income

Making land produce high profitable yields over a long period of time is a major problem involved in a long-range agricultural program. Experience has taught farmers, as well as scientists, that soils are not indestructible, but must be protected and their fertility maintained while they are producing; otherwise, the production will decrease after a period of time. This period of time is very short in some parts of the country, especially the South.

It is well for scientists and farmers to give some serious thought to the actual time the natural fertility of the soils will last under the prevailing type of agriculture. Experiments have shown that the supply of fertility in the native prairie soils of Northeast Missouri has a life span of 40 to 50 years when managed under continuous wheat crops or under continuous grazing. It must be remembered, however, that the soils of Northeast Missouri developed under less intensive climatic conditions than did the soils of the Southeastern states. A period of 40 years, although short to the people of the Midwest, is longer than we could hope for the natural

TABLE III. VALUE OF FARM PRODUCTS EVALUATED AT A CONSTANT PRICE LEVEL * (AVERAGE PRICE OF 1935-39 USED)

Item	1928–32	1935–39	1940–45
Crops	$105,480,000	$124,915,000	$125,973,000
Cotton and Seed	94,184,000	110,458,000	101,902,000
Corn	413,000	1,417,000	2,122,000
Oats	20,000	55,000	875,000
Hay	599,000	716,000	1,015,000
Livestock and Products	25,330,000	29,744,000	41,188,000

* Reports of B. A. E.

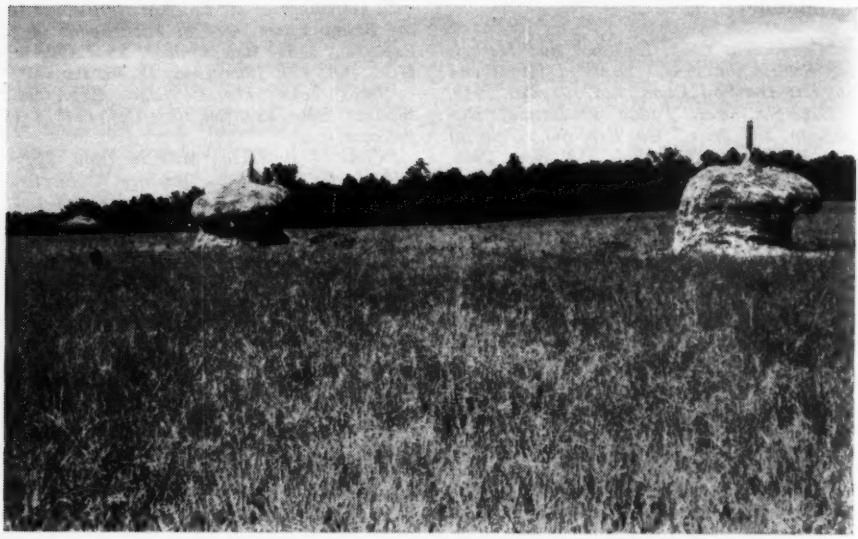

Fig. 4. This photo shows an untreated pasture from which hay was cut and stacked for the cows in winter. They refused the hay from the untreated area and some of them died during the winter.

fertility of Southern soils to produce profitable yields without commercial fertilizers.

The process of cultivation fans the fire (oxidation) that rapidly burns up the organic matter in the soils of the South. Therefore, in order for these soils to deliver adequate fertility into the growing plants, the nutrient ailments must be ministered to quite often. This applies to the pasture and meadows as well as the land utilized for row crops.

Because of these handicaps, the Southern farmer, in order to do a job that will reflect credit on himself and bless future generations, must plan every acre and treat it according to soil needs. Although the farms are limited in size, if every acre of land is planted to adapted crops and treated according to fertility needs, the volume of production and income are usually high.

The volume of production for part of the farm products produced in Mississippi from 1928 to 1940 is expressed in Table III. In order to eliminate price variations, the average price received during the 1935-39 period was used for all the periods. These data indicate the increase in the total volume of production by the farmers of Mississippi. The increases in livestock and hay have been especially great and reflect a wise use of land that was once in row crops.

TABLE IV. CHANGES IN FARMS AND FARM POPULATION IN MISSISSIPPI *

Item	1930	1935	1940	1945
Farmers	313,000	312,000	291,000	264,000
Owners	87,000	94,000	98,000	107,000
Tenants	226,000	218,000	193,000	156,000
Farm Population	1,361,000	1,333,000	1,400,000	1,050,000

* Reports of B. A. E.

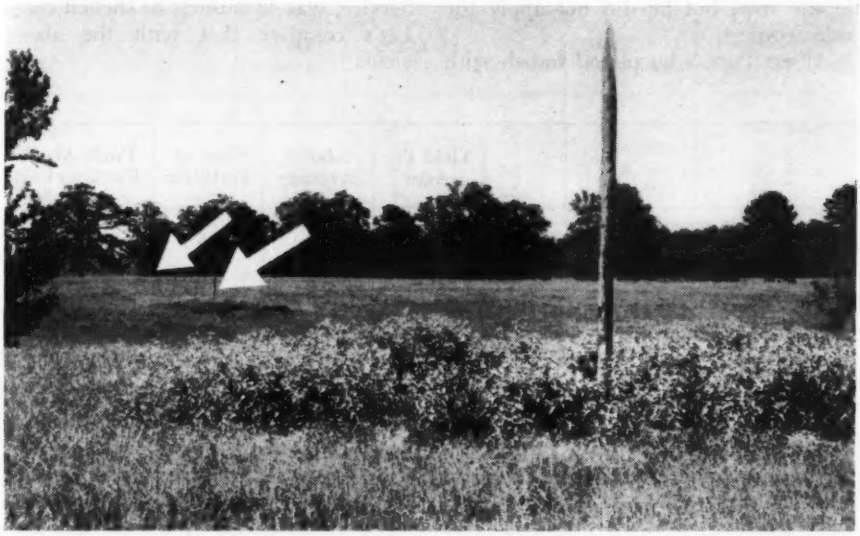

Fig. 5. This photo is a pasture treated with minerals. The hay was stacked the same as that in Figure 4. The cows ate all of the hay in the stacks from this pasture.

Efficient farmers are protecting the land with soil-conserving crops which are being marketed through livestock. The volume of livestock and products sold during 1940-45 was 63 per cent greater than during 1928-32.

Evidence of a higher farm efficiency is seen in the number of farmers and the ownership relation. Table IV shows the number of farmers, owners, tenants, and the farm population from 1930 to 1945. It is to be noted that the number of farmers has decreased consistently since 1930, while the number of farm owners has increased. This indicates that the larger volume of production was accomplished by fewer workers and that the output or production per worker has increased, which in turn indicate more agronomic efficiency and proper use of land on the farms throughout the State. Many of the farmers now have more than one major cash crop. This diversification has made more opportunities on the farms of the South, and many college-trained young people are now returning to the farm to further help develop a well-balanced agriculture and industry in their native land.

Veterans Top 100-bushel Corn Yield

(*From page* 26)

before would not have yielded 25 bushels of corn, this year go to 115 bushels? First, plenty of plant food was supplied; second, there had been a heavy crop of weeds decaying on the ground for three years and this was well mixed with the soil when it was prepared for planting.

William Houghton, who placed third with 111 bushels, planted his test acre in part of a 5-acre field, not making any effort to use the best land, just average. In fact, his yield was cut down by a roadway crossing the land the year before and leaving it hard. This strip could be seen all summer in the growth of the corn. He used about the same fertilizer as Kerns, putting it

in the row, but he did not apply the side-dressing.

Albert Post, who placed fourth with Service, was 43 bushels of shelled corn. Let's compare that with the above yields:

	Yield Per Acre	Above Average	Cost of Fertilizer	Profit Above Fertilizer Cost
James Kerns	121	78	$25	$131
Howard Kines	115	72	35	109
William Houghton	111	68	36	100
Albert Post	100.5	57.5	36	79

a half bushel over his goal, would have been near the top if the season had not been against him. His corn was on low ground and several spots were so wet that the corn on them almost drowned out. In a test of a small plot where it was not wet, the corn yielded at the rate of 135 bushels per acre. Post used about 1,200 pounds on his test acre, putting 1,000 in the row and side-dressing with 200 pounds of nitrate of soda.

The average yield in West Virginia this year, according to the State Department of Agriculture Crop Reporting

We computed the price of corn at the local selling price of $2.00 per bushel for local corn.

Suppose we compare these yields with what the same land would have done with less fertilizer. We had the chance to do this in two of the trials, as stated above. Houghton and Post used part of their regular fields to make this trial and we checked on both farms. On the Houghton farm, with about half as much fertilizer, we had a yield of 87 bushels of shelled corn; on Post's field, 67 with half as much, less the side-dressing of 200 pounds of nitrate.

Fig. 3. Howard Kines in his field. Note the density of the fodder and immense size of the ears. Kines used the same application on his entire field, and on 2.38 acres husked out 591 bushels of ears.

	Test Acre	Check Plot	Increase	Additional Fert. Cost	Profit Above Add. Fert. Cost
Houghton	111	87	24	$18.00	$30.00
Post	100	67	33	24.00	42.00
Kerns	121	87	34	12.50	55.50
Kines	115	87	28	17.50	38.50

We made no check on the last two plots but used the highest yield in the other check. However, there are very few farmers who use as much fertilizer as these two did in their regular fields, which was about 500 pounds per acre.

What does this mean to farmers in this State if they follow the example of these four boys and some other farmers over the State? In the first place, it means cutting to less than half the plowing of our hill lands in order to produce the corn we need, or else we can grow more of our own grain. It means less erosion on our hill lands and more land left in grass for a longer period to insure future prosperity for the State. It also means much less labor used in producing a bushel of corn. In the fields of these boys it means larger crops of grain and corn to come, for all of them left the fodder to be turned down to add organic matter.

These boys are going to try to produce 150 bushels shelled corn next year and several more of the class will join them.

Fertilizing Tomatoes for . . . Quality

(*From page* 8)

Earliness in itself, however, is not the only goal in producing a tomato crop. Quality is equally important and the influence of proper fertilization on quality can be most marked. The favourable effect of potash on quality in tomatoes is well founded. Hester has shown that the puree yield, per cent of total solids, and sugars are closely related to the amount of potash per acre, provided the potash was properly applied so that it became available and showed an increasing effect on yield. When one realizes that the sugar-acid ratio in tomatoes is lower in Ontario than in other tomato-producing areas, the necessity of adequate potash becomes much more important. But, unfortunately, there are other inherent characters in Ontario soils which make the problem of K_2O fertilization more complex.

In the January 1948 issue of Soil Science, Bear and Toth report on the "Influence of Calcium on Availability of other Soil Cations." The results of their investigations on 20 of New Jersey's most important agricultural soils led them to publish the following statement: "For the ideal soil, it is suggested that 65 per cent of the exchange complex should be occupied by calcium, 10 per cent by magnesium, 5 per cent by potassium and 20 per cent by hydrogen." This suggests that a calcium-potassium ratio of 13:1 is ideal.

In some of our Ontario soils, this ratio runs to 115:1 and ratios of 35:1 and 50:1 are common. In cases such as these, the efficiency of the K_2O applied is notably decreased. The result is that we have been recommending to most of our growers a fertilizer programme which alone would supply about 180 lbs. of K_2O per acre. These recommendations are, of course, based

TABLE II

Treatment	Yield in Tons/Acre
1,000 lbs./a 3–12–15	14.6
1,000 lbs./a 0–12–20	15.3
1,000 lbs./a 2–12–16	10.7
1,000 lbs./a 2–12–10	11.7

on soil tests and there is only a small percentage of the soils on which our tomatoes are grown that requires less than these amounts. The results have justified these applications and growers have had marked improvement in colour when the K_2O level was raised to 200 lbs. per acre. Effects on yield have also been favourable. Typical are the results obtained from a replicated trial located on a Beverly fine sandy loam at Chatham in 1947. These results are given in Table II.

The increased yield at the 15 and 20 per cent levels of K_2O is quite significant. These results have been verified by other trials.

The data presented indicate clearly that proper fertilization can be one of the major factors in inducing earliness and quality in the processing tomato crop in Ontario. Sufficient phosphorus properly applied can advance the crop as much as two weeks. Adequate supplies of potash are essential for proper maturing of quality fruit.

"Put and Take" in Grassland Farming

(*From page* 10)

pounds of 10-4-13 for the poorest soil.

That the dairyman is gambling with his soil bank account in grass fertilization unless he takes care of his potash assets is shown in the last table—"Put and Take."

The hay from the soil with the highest fertility rating removed the equivalent of 100 pounds of a 10-0-33 more than was applied in the topdressing. For the poor soil the deficit was equal to 70 pounds of a 10-0-53.

For the good producing soil that put 3 per cent of potash in unfertilized hay, the deficit of 33 pounds of potash did not nick the revolving fund of plant food to and from the field very much. For such good grass sods the 1-1-1 fertilizer ratio was considered a good choice. But to take 37 pounds of potash from the soil that could produce but 2,600 pounds of hay per acre is another matter. This plus and minus study certainly gave Browne more confidence in the emphasis by New England Extension Services and farmer usage on fertilizers with a 1-2-2, 1-3-2, or 1-3-3 ratio in starting roughage improvement on land that has not been well manured or fertilized. The results of the 1948 Green Pasture Contest in Hampden County did not change the

TABLE IV—RECOVERY OF PLANT FOOD—POUNDS PER ACRE

Soil Fertility Rating	From 500# 10–10–10			From 1,000# 10–10–10		
	N	P_2O_5	K_2O	N	P_2O_5	K_2O
Good	60	25	83	86	33	132
Fair	35	16	57	59	26	97
Poor	57	20	87			

TABLE V—PUT AND TAKE—PLANT-FOOD CONTENT OF GRASS HAY IN TERMS OF MIXED FERTILIZER

	Lbs. Plant Food Removed			Equivalent to Fertilizer Grade			At Pounds per Acre
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	
Good soil—fertilized	122	49	202	10—	4.1—	16.5	1,220#
Good soil—unfertilized	62	24	119	10—	3.9—	19.2	620#
Recovery from 500# 10–10–10	60	25	83	10—	4—	13.8	600#
Removed from soil	10	.....	33	10—	0—	33.0	100#
Poor soil—fertilized	105	40	134	10—	3.8—	12.8	1,050#
Poor soil—unfertilized	48	20	47	10—	4.2—	9.6	480#
Recovery from 500# 10–10–10	57	20	87	10—	3.5—	15.2	570#
Removed from soil	7	.....	37	10—	0—	53.0	70#

emphasis. County Agent Browne sorted the records of the 60 entrants in this county into groups according to the scores. The 34 dairymen who made a score of 70 to 89 per cent (there were none higher) had an average use of plant food, exclusive of stable manure, *per cow* equivalent to 320 pounds of a 10-35-22 or 640 pounds of a 5-18-11 mixture.

The conclusion that Browne has reached from this grassland fertilization work is that whatever is done with lime, nitrogen, and phosphorus to grow more grass needs to be kept in step with the capacity of grass to take in potash and the ease with which the potash can be lost in the field-barn-field cycle. If you take more off, more must be put back for prosperity and posterity.

Maintaining Productivity of Irrigated Lands

(*From page* 18)

grain sorghums grown continuously for nine years yielded 55 bushels per acre, but following alfalfa, produced 75 bushels.

Figures 8 and 9 show yields of crops in rotation with alfalfa.

Winter green manure crops are proving very helpful in maintaining soil productivity. A cooperator with the Swisher County Soil Conservation District reported a yield of 61 bushels of grain sorghums following a green manure crop of vetch, as compared to 45 bushels on an adjacent field not following vetch. These yields are from land that has been under irrigation only a relatively short time, and soils which are inherently very fertile.

Figures 10 and 11 show yield increases following soil-improving crops at some experiment stations.

Improved irrigation pastures of mixtures of legumes and grasses are becoming of value in the agriculture of the West. These pastures produce excellent forage for livestock, and carrying capacities of more than one cow per acre for 8 to 9 months are being reported.

The mixtures of grasses and legumes have a very beneficial effect upon the soil. The dense ground cover prevents soil erosion on sloping lands. The dense root system of the mixture im-

proves the structure of the soil and increases its capacity to absorb water. The grass roots, because of their volume, density, and fibrous character, have a binding effect on loose soils and a loosening effect on heavy soils. The legume in the mixture assimilates nitrogen from the air and, through the decaying roots high in protein, contributes nitrogen to the soil. The combination of rapidly decaying legume roots with slowly decomposing grass roots results

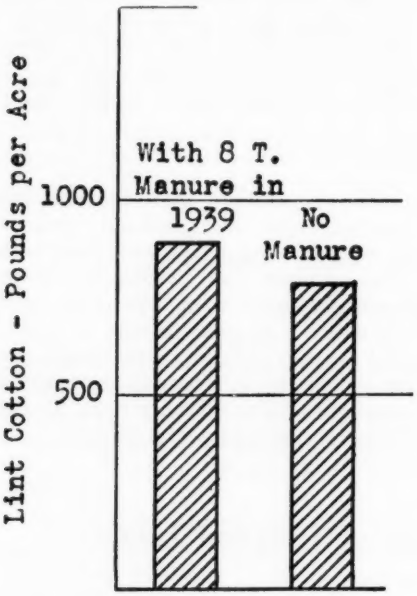

Fig. 7. Yield of cotton at the Agricultural Experiment Station at Lubbock, Texas, 1940. (7)

in a prolonged benefit to the soil in tilth, permeability, and resistance to soil erosion.

Some of the grasses and legumes that are proving successful in mixtures in the High Plains and other areas are perennial rye grass, crested wheat grass, smooth brome, orchard grass, Dallis grass, and alfalfa, biennial sweetclover, vetch, Ladino, and white Dutch clover. Others are very successful in other parts of the country.

Crops grown in rotation with and following the pasture benefit materially from the improved condition of the soil.

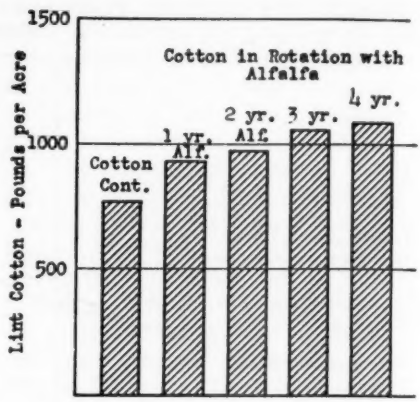

Fig. 8. Yield of cotton at New Mexico Agricultural Experiment Station. (6)

Observations on improved pastures have shown that the soil improvement progresses most rapidly during the first few years after the pasture has been established. The best rotation in order to take full advantage of the soil-improving capacity of a pasture crop is to grow about 3 to 4 years of pasture followed with 3 to 4 years of soil-depleting crops.

Commercial fertilizers are used in large quantities in almost all of the irrigated areas. From analyses of soil samples and results obtained in field and experimental trials, it appears that nitrogen and phosphorus are the plant nutrients most commonly deficient.

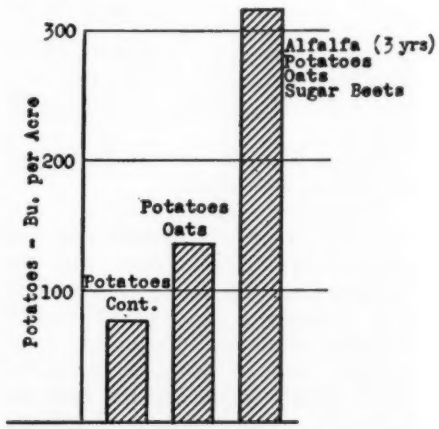

Fig. 9. Yield of potatoes at Scotts Bluff, Nebraska. (5)

Potash is deficient in the more sandy soils in some areas.

Recommendations for the kinds and amounts of fertilizers depend largely upon the needs of the soils and the crops to be grown. Commercial fertilizers alone will not solve soil fertility problems. They should be used as needed to supplement a program of maintaining the soil organic matter through manures and other soil-improving measures.

Too many farmers do not realize the importance of getting a uniform application of water in the amounts required by the crops. Lack of even penetration may permit the accumulation of salts in spots, or leaching of plant foods in other places.

Crops vary widely in their water requirement. Alfalfa and improved pastures require large amounts of water, whereas quick-maturing crops as vegetables and grain sorghums require lesser amounts. On sandy soils having low water-holding capacities and of open porous nature, frequent light irrigations are more efficient, whereas larger amounts of water at longer intervals can be applied on fine-textured soils as clay loams. The irrigation water requirement of crops varies with climatic conditions, such as rainfall and temperatures. Soils with saline accumulations may require special treatment such as heavy leaching to remove the salts.

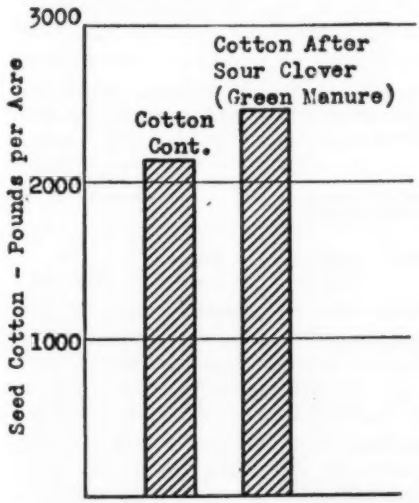

Fig. 10. Yield of seed cotton at New Mexico Agricultural Experiment Station. (6)

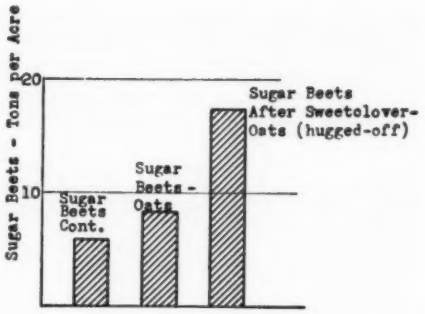

Fig. 11. Yield of sugar beets at Scotts Bluff, Nebraska. (5)

The problems connected with proper application of water are many. The problems of a particular area must be studied and measures adopted to fit that area.

The El Paso-Hudspeth Soil Conservation District in West Texas, realizing the importance of getting water applied properly, has developed a plan which includes the following:

1. Leveling.
2. Designing and establishing a distribution system.
3. Laying out the method of applying water.
4. Floating.
5. Soil-improving practices.
6. Applying water when needed and in the amounts needed.

The soil conservation districts have recognized the need for a coordinated plan designed to fit the land. Almost all of the irrigated land in Texas is now in an organized soil conservation district. These districts have recognized the need for doing something and are doing it with the assistance of the Soil Conservation Service and other agricultural agencies.

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Lime Needed to Maintain Fertility

(*From page* 20)

Low productive soils to a considerable extent have lost their capacity to retain large amounts of replaceable calcium (Tables 1 and 2). Liming low productive soils raised the pH to a point equal to that of the high productive level pH 6.5. The available calciums in the two were by no means equal. The low productive soils were increased in calcium from 730 pounds up to 3,000 pounds an acre by liming. High productive soils increased from 7,700 pounds up to 10,000 pounds calcium an acre by liming (Table 1).

Limestone applied to both high and low productive soils gave a substantial build-up in total organic matter (Table 1). This build-up was due in a large part to improved legume growth on limed land. The experiment fields considered have been in operation for more than 30 years, and the cropping system has usually been a four-year rotation in which considerable legume growth has been provided for plow-under material.

The soybean is a legume which will produce abundantly on soils having considerable acidity. However, under Midwest field conditions when soils become too acid, even the sturdy soybean plant fails to give a satisfactory yield and the beans may be deficient in nitrogen. Soybeans grown on untreated soil of the Oblong experiment

TABLE II—REACTION, REPLACEABLE CALCIUM, AND TOTAL ORGANIC MATTER IN UNTREATED AND LIMED SOILS ALONG WITH SOYBEAN YIELDS AND NITROGEN CONTENT OF THE BEANS

Experiment Field	pH	Pounds an Acre		Soybeans	
		Replaceable Ca	Organic Matter	Beans bu/A	N Per cent
		Untreated Soil			
Joliet	5.5	5,000	96,000	24	6.4
Oblong	4.8	1,000	44,000	14	5.7
		Limed Soil			
Joliet	6.4	7,000	96,500	26	6.4
Oblong	6.1	2,800	47,300	16	6.8

Fig. 2. Red clover on the Ewing experiment field. The limed land on the left had a reaction of pH 6.2 and contained 3,000 pounds of replaceable calcium and 38,000 pounds of organic matter in the topsoil. The unlimed land on the right had a reaction of pH 4.5 and contained 520 pounds of replaceable calcium and 32,000 pounds of organic matter in the topsoil.

field averaged only 14 bushels and the beans contained only 5.7% nitrogen (Table 2). Where the soil was limed and the reaction raised to pH 6.1, the bean yield was 16 bushels an acre and the beans contained 6.8% nitrogen. The Oblong field soil was also deficient in both phosphorus and potassium; and when these elements were supplied to the soil, the soybean yield was 24 bushels and the nitrogen content of the beans was 6.5%.

It is apparent that when field soils become too acid this condition limits the capacity to produce crops which are satisfactory in both quantity and quality. The answer to this is sufficient limestone and an attempt to supply all other elements which may be deficient. On moderately acid soils, pH 5.5, additions of limestone may prove profitable by creating in the soil conditions for better legume growth and other desirable biological and chemical functions. When fertilizer applications are adjusted to meet the needs of all crops, there need be very little concern about overliming.

Outmoded Bygones

(*From page* 5)

for the central market. It was either a rear runner ride or a sled attaching venture, the big loads of wood concealing our presence from the drivers. Our parents scolded us for it and hinted at injuries, but I paid no heed until a little girl in my grade fell off a bob and received a nasty clip from the hoofs of a horse close behind. She was carried into our cottage and laid on the "sofa" where I used to read my Henty books. Effie recovered all right, but I needed only to look at a tiny blood spot on the old, brown head rest to turn me toward safer sports—like skating on thin ice or stealing melons.

Gone also forever are the wooden hitching racks in front of the stores and along two sides of the market square.

"Cribbing" horses (and hungry ones) would gnaw the posts and look with yearning at the iron watering troughs while their masters were quenching their thirst in the taverns—or maybe at the old town pump.

There's a dead bygone for you, if there ever was one—the town pump! The battered tin cup fastened to the pump by a dog chain was a symbol of "all for one and one for all." On hot summer days and stifling nights the creak of the handle and the clatter of the cup sounded forth as regularly as the town clock's strokes.

WE never paused to think of the germs which this common quaffing custom spread among us in democratic fashion. No, for the air was hot, the water was cool and refreshing, and our parched toes curled in glee as the drippings splashed upon them. And the most of us lived through it anyhow, to finally stand in wonder along about 1900 when the first bubble fountain in our town was placed right where the ancient aqua pura plunger had laved the throats of many generations without benefit of hygienic laboratory.

Oh yes, and before I quit the street scenes for other flashes backwards, let's pay parting tribute to the "carriage blocks" which stood before so many of our homes. They were about four or five feet square, with about four short steps on the side toward the house; and they stood at the curb. Often an effigy of an urchin with outstretched arm was mounted on a post near the carriage block, to which a team might be tied while the family prepared to sally forth in the high-pitched buggy. I recall how some of the big kids used to switch these blocks around on Halloween nights—even putting them where the modest privies stood and dragging the backhouses to the street locations.

Always in my dreams I see those stores again, almost as real and entrancing to me as they were along back then. We liked the drug store best. It had colored liquids in glass globes in the show windows and rows of labeled drawers and medicines, herbs, and roots on many shelves. The big, hot stove in the rear always had mechanical figures of pasteboard above it that sawed wood or cobbled shoes or rode horses in the upward draft of warm currents. The department store had a cash carrier and tracks which fascinated all the urchins when their mothers waited for change. In the drug store you could buy slippery elm bark to chew in school, or lozenges for the girls, or liniment for Ma's sore knee; and there you often saw Old Doc Gorton in solemn conference with John Gresham, the master of the pharmacopoeia. It was there, alack, that the doughty Doc got all those villainous nostrums with which he bullied you into submission when you fancied you had a fever that should keep you from school on a cold day.

I also take kindly in retrospect to the charm of the bake shop. Those rolls for ten cents a dozen, with one extra for old times' sake, and the fancy bridal cakes and the little silvery bell that rang when you opened the front door. Down at Kiser's butcher shop, with sawdust floor and red-knuckled clerks, they gave you a ring of bologna when you paid for a mess of steak or spareribs, and handed you pig bladders which could be scoured and partly dried and inflated for footballs. Their abattoir (locally known as the slaughter-house) supplied all the community with its fresh meat without any purple stamps or inspection folderol.

REMEMBER the grocery too, with its open bean barrel for the cats to hide in, the rumbling coffee grinders run by hand, and the jugs of vinegar and cans of kerosene with potato-corked spouts which you had filled there?

Our old-time saloons were not the open-faced, everyday free-for-alls which libation spots assume today. They bore no dignified or lyric names. They hid behind curtained doors and screened

windows, and women almost never entered there unless they had wayward husbands or were rather that way themselves. I cannot exactly speak from personal enjoyment of the piece de resistance which those drinking places featured, known as the "free lunch." Yet they rivaled one another in the bounty and variety of the cold repasts served on a small counter at the rear, of which all customers were free to partake regardless of the state of their purse or sobriety.

OUTSIDE of the stores were other points to remember. The harness shop kept a neat but weatherworn pony standing on a block, on which in summer the boss spread fancy new flynets and again in the fall, a gaudy woolen blanket. Next door was the shoe store and town cobbler's shop. It also advertised its stand with a huge gilded boot hanging on a beam. Then, of course, that relic of museum fame—the Indian cigar clutcher—held out his fistful of stogies to remind your Father that he should get a box of cheroots in time to treat his friends on natal days and for election bets. Along with the dodo, the steam calliope, and the backyard "specialty," the chieftain of the cigar store emblem has been gathered to the everlasting boneyard.

Speaking of election bets reminds me of the eventful evenings we spent at the court-house auditorium waiting for the returns or attending county party conventions. The radio and television addicts of today may have missed some of the fun after all.

The crowd assembled along about nine o'clock on election night. The county chairman or some other dignitary held the floor and read all the telegrams which were fetched in every once in awhile from the local telegraph office by errand boys. It was rather slow business sometimes, but we had a fiddler on hand and a few roaring fellows who had been doing electioneering too close to the bartenders. We seldom were sure of what the final outcome would be when we dutifully went home to roost before midnight struck in the town clock chime.

To leave that scene and get a breath of fresh air, how many of you recall the numerous bands of wandering horse-traders and gypsies who toured the countryside each season? This surely is a thing almost never seen today. Rural Americans of my time loved the equine species and delighted to test their acumen as judges of fillies against the best that came along. They even took some pleasure in being shamefully deceived and flatly swindled, because they expected to be and took it in their natural stride. I presume that there is equal chance to get a shellacking in a car deal nowadays, but there isn't the carnival spirit about it like there used to be when a dozen wagonloads of shrewd gangsters and their feminine cohorts invaded the town.

You see, the legends of Europe followed in the wake of all these sinister and Bohemian caravans of fortune-tellers and nag hostlers. They camped near the outskirts and us kids received due warning from parents not to fraternize too much with these vicious strangers, especially after sundown. That only lent a zip and zest to the adventure and gave the gypsy crews a glory that they hardly deserved.

ON summer evenings when we were young the streets were strolling places. Today they are just convenient avenues for going to work or distant recreation. In those older and simpler times the streets were show places for finery and thoroughfares by means of which you greeted neighbors as they sat on their front porches in the twilight. You courted your gal thereon and used the street to escort her to the drug store for a five-cent (I said five-cent) ice cream sundae.

Everything from politics to religion and rents got its innings on the porches

that overhung those quiet, shady streets. When you approached to pass a house with your best girl at your side, there would be a slight pause in the murmur of evening speculation and gossip indulged in by the observing rocking-chair brigade. Greetings would be exchanged, smiles flung back and forth, and then you passed on out of earshot. Thereupon the chatter of the porch sitters would be resumed and both of you just knew that *somebody* was getting discussed in frank debate.

MAYBE you fooled them and went to a movie instead of hunting for a private bench in the dark park. In that case it only cost you a nickel to pass the portal and be led to a seat by a kid you called by his first name. The shifty, flickering screen shadows of the silent movies helped you forget what snippy gossips might be saying. John Bunny, Flora Finch, and Francis X. Bushman soon regaled you with the best that films could furnish. You thought how smart and public-spirited Hank Jones had been, to transform an old livery stable into this palace of pleasure. You squeezed her hand and felt happy.

I might also rave betimes about livery stables too, and the drummers who patronized them, the funerals that depended upon them for solemn style, and the weddings that likewise relied on the hired carriages to make them high-toned affairs. But the hour is late and we have but a moment to dawdle on old and forgotten things like these.

I could tell you about Dad's gilt mustache cup and his shaving mug that Barber Kirk kept in that cabinet with the lather cups of other civic leaders. I could speak in fun after all these years of the asafetida bag that Ma made for me to wear tied around my neck in winter—to ward off the germs, she claimed. I could retell the story of my heavy knitted wool socks that Ma made for me under some protest. They bulged in the wrong places just as I was becoming conscious of my appearance before the tender sex. I could speak of haircuts for a quarter, patent-leather shoes for three dollars, neckties thrown in with every suit, and eggs for thirty cents a dozen.

But I'd be obliged to tell the other side too—a dollar a day in wages for twelve hours' toil and plenty of discomforts to those who earned their bread in factories. So if we ever yearn to return to those obsolete days because they were cheap and simple, we'd have a penalty to pay for all the privilege.

No, we won't go back in the flesh, much as we dwell upon it in the spirit. Yet I often wish that along with a pace like ours—including four hours' flying time from coast to coast—we could figure out some better social and economic gadgets to make lives longer and more sublime.

It often seems to me that there must be some unchanging thing about humanity in both its morals and its mistakes, whereas in mechanics we can force issues and shift gears and get results that seem nicer and more convenient and pleasant. I suppose that's it—because our folks away back in the period I spoke about had the same basic good and bad mixtures in their make-up as folks have now. You can regulate and adjust a machine or get up a new invention and throw out the old implement, but somehow that doesn't work at all with human beings. They'll rebel or outvote you!

BUT hush me up! I must stop this sermonizing because it doesn't fit my style. Just because a geezer lived in the rough-road days and marveled at smoky magic-lanterns and cylinder phonographs is no reason why he needs to set up as a prophet or a directing genius.

Anyhow, now you know where I was brought up and when, and anytime you care to match memories with mine leave your name with the publishers.

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Californian: "Stop fingering that grape."

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Rastus: "Is you sure 'bout dat?"

Undertaker: "Shall I bury her or embalm her?"

Rastus: "Don't let's take any chances, brother. Cremate her."

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In a short while Johnny came back beaming. "It's all right," he announced cheerfully. "God said that those big dogs had Him fooled at first, too."

★ ★ ★

Jones: "Look at that bunch of cows."

Smith: "Not bunch, herd!"

Jones: "Heard what?"

Smith: "Herd of cows!"

Jones: "Sure, I've heard of cows."

Smith: "I mean a cow herd."

Jones: "What do I care if a cow heard? I didn't say anything I shouldn't have!"

★ ★ ★

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THE PLANT SPEAKS

A new four-reel series of 16 mm., sound, color films which may be booked independently or in any combination. They may be used to best advantage when shown at least one day apart and in the following sequence:

THE PLANT SPEAKS THRU DEFICIENCY SYMPTOMS pictures soil depletion, erosion, and deficiency symptoms on plants. (Running time 25 min. on 800-ft. reel.)

THE PLANT SPEAKS, SOIL TESTS TELL US WHY depicts taking soil samples on the farm and the interpretation of soil tests. (Running time 10 min. on 400-ft. reel.)

THE PLANT SPEAKS THRU TISSUE TESTS shows the value of tissue testing and the procedure for testing plant tissues in the field. (Running time 14 min. on 400-ft. reel.)

THE PLANT SPEAKS THRU LEAF ANALYSIS evaluates leaves in plant growth and leaf analysis in determining fertilizer needs. (Running time 18 min. on 800-ft. reel.)

We shall be pleased to loan these films to agricultural colleges, experiment stations, county agents, vocational teachers, responsible farm organizations, and members of the fertilizer trade.

OTHER 16MM. COLOR FILMS AVAILABLE FOR TERRITORIES INDICATED

Potash in Southern Agriculture (South)
In the Clover (Northeast)
Bringing Citrus Quality to Market (West)
Machine Placement of Fertilizer (West)
Ladino Clover Pastures (West)
Potash from Soil to Plant (West)
Potash Deficiency in Grapes and Prunes (West)
New Soils from Old (Midwest)
Potash Production in America (All)
Save That Soil (All)
Borax From Desert to Farm (All)

IMPORTANT

Requests should be made *well in advance* and should include information as to group before which the film is to be shown, date of exhibition (alternative dates if possible), and period of time of loan.

American Potash Institute
1155 Sixteenth Street
Washington 6, D. C.

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